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Description and criticism of the first 4 years of a freshman seminar program designed to intensify the intellectual experience of the freshman year. Deals with historical background, evaluation in terms of the program's aims and academic performance, special issues, and the future of the program. A separate chapter discusses the seminar method in considerable detail. The appendixes include a separately printed description of over 100 freshman seminars. The report, written by Byron Stookey with the endorsement of the Subcommittee of the Committee on Educational Policy appointed to evaluate the Freshman Seminar Program, includes seven recommendations of the subcommittee.

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THE FRESHMAN SEMINAR PROGRAM

a report to the
Faculty of Arts and Sciences

February 1963

Harvard

ED000930

Recommendation of the Subcommittee of the Committee on Educational Policy appointed to evaluate the Freshman Seminar Program

The committee has concluded after studying the program's first four years that its continuance on a permanent basis is important.

The committee has made a substantial statistical study; we have interviewed, personally or by questionnaire, almost every student who participated in a seminar and a similar number, of equivalent potential, who did not; we have talked with most of the members of the faculty who served as seminar leaders. The evidence is overwhelming in favor of continuation.

There have been problems, particularly in areas of study requiring uncommon technical preparation. And there have been freshmen who have misused their freedom in seminars, though there is no evidence that such misuse has been more prevalent in the seminars, despite their lack of grades, than in the freshman year as a whole.

We believe that the College has developed a way of teaching its first-year students that has great vitality and importance. We do not maintain that this is the only way or that seminars should be required. We do maintain that such seminars, like General Education courses and introductory departmental courses, should be among the College's regular offerings.

The objectives and methods of the seminars have changed, or at least their emphasis has shifted, as the program has developed:

—Originally, considerable emphasis was placed on the needs of students who come to the College with unusual preparation in, and commitment to, a particular field of study. Some seminars have in fact been designed for such students and have achieved considerable success. But many others, equally successful, have demanded no special preparation and have admitted students of diverse backgrounds and ability. In these cases the seminars have served a broader purpose: to engage the ordinary freshman, quickly and actively, in the intellectual life of the University.

—Few seminars have successfully attempted to involve freshmen in a meaningful way in research at the "forefront of knowledge." That approach has largely given way to efforts to engage the student in inquiry of a kind that will constitute a frontier for him, whether or not it coincides with the current preoccupations of scholars in the field.

—Junior as well as senior members of this Faculty are engaged actively in original research. Many of the former have proved as able as the latter in communicating to students the nature and methods of intellectual inquiry. The proportion of junior men offering seminars has therefore increased during the experimental period.

—The original legislation provided that a student might devote as much as half of his program to the work of a freshman seminar. Two course credits were authorized. Experience has shown that credit is indeed important (few seminars offered extra-curricularly have fared well), but in the majority of cases one course credit has seemed sufficient.

In the four years ending June 1963, the program will have offered 130 seminars, accommodating about 1132 students and providing approximately 1845 "student-terms" of instruction.

	59-60	60-61	61-62	62-63	total
Seminars	21	33	36	40	130
in natural sciences	6 28.6%	8 24.2%	10 27.8%	12 30.0%	36 27.7%
in social sciences	11 52.4%	13 39.4%	16 44.4%	22 55.0%	62 47.7%
in humanities	4 19.0%	12 36.4%	10 27.8%	6 15.0%	32 24.6%
Harvard enrollment	148	223	207	c. 218	c. 796
Radcliffe enrollment	54	85	93	c. 104	c. 336
Total enrollment	202	308	300	c. 322	c.1132

Students have repeatedly said that their freshman seminar was the key intellectual experience of their first year. Close involvement with scholarship gave them early understanding of the nature of the university; they state that they felt engaged in its intellectual enterprice, an affirmation heard more usually from honors candidates in their senior year. They learned the nature of scholarly inquiry: its rigor, its integrity, and its rewards.

For some the seminars confirmed earlier interest in an area of study; for others they led to the decision not to enter a field; for still others they opened hitherto unknown areas of knowledge which drew them in new directions.

Though the seminars cannot, we realize, be judged on the basis of grades in courses, it is interesting that the students who were in seminars have stronger over-all academic records, in courses and in tutorial, than other students who came to college with the same measured "promise."

The majority of faculty members who have conducted seminars are enthusiastic and believe in the program. There are varying degrees of enthusiasm, but the favorable balance is clear.

On the basis of these findings the subcommittee unanimously recommends:

1) That the program continue, and that it be primarily for freshmen.
2) That the program continue to offer seminars for students with highly developed special interests, but that it emphasize offerings designed to engage the ordinary student, quickly and actively, in the life of the University.
3) That flexibility of structure and method be preserved, and a wide diversity of offerings encouraged.
4) That the seminars continue to be elective.
5) That the seminars retain their present status as divisible, ungraded courses with a maximum credit of one course.
6) That the committee reviewing the program of General Education be requested to consider the relation of the seminars to that program.
7) That a standing committee of the Faculty of Arts and Sciences be appointed to supervise the freshman seminar program.

Donald Griffin
Eugene Rochow
F. Skiddy von Stade
Laurence Wylie
John Conway, Chairman

The following report on the program, written by Mr. Byron Stookey, has the endorsement of the committee.

The following report is not intended as a definition of policy or as prospectus for a Program. It is a description and criticism of an experiment which if it continues will inevitably find other and better forms.

It attempts, without evading the seminars' failings, to give a sense of what such teaching, when it is good, can do.

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II. description of the seminars (included as a separate document)

I. HISTORY

In May of 1959 the Faculty of Arts and Sciences passed the following legislation:

> That for the academic year beginning July 1, 1959, the Faculty authorize course credit for special supervised study by Freshmen who are recommended for this privilege by the Committee on Advanced Standing, in order to permit, under the direction of this Committee, experiments designed to intensify the intellectual experience of the freshman year. These experiments shall be continued beyond 1959-60 only after review and further authorization by the Faculty.

That legislation was not capricious, its presentation to the faculty not an impulsive response simply, as some have thought, to an offer of financial support. Though the proposal's appearance at that moment had indeed to do with the generous gift of an alumnus it represented more than a year of discussion in various quarters about increasing needs in the freshman experience and how those needs might be met. The funds and the donor's convictions were an important catalyst; the reaction had begun long before.

the need

Six years ago "the Exeter syndrome" was a popular topic of discussion. That phenomenon was viewed by many with a kind of amusement: Exeter, clearly, was a fine school, and so, equally clearly, was Harvard; the Exeter syndrome seemed a minor, almost humorous incompatibility in an essentially idyllic relationship. But some who watched closely were more concerned. We suspected that what was involved in the Exeter syndrome was something more complex than "over-preparation," that it had disturbingly much to do with *Harvard*, and that it was quite likely only an especially visible manifestation of problems affecting students from schools quite different from Exeter.

What we saw when we looked closely was that the students who left Harvard, as graduates of Exeter were supposed to do, came not only from Exeter but from unprestigious public schools;

that masterful "under-achievement" was a capacity, in Harvard's freshman year, not only of "over-prepared" Exonians but of others who were if anything under-prepared; that a too-extended difficulty in getting one's feet on the ground was common to many students who had neither Exeter nor anything else discernible in common except that they all were freshmen. And so we began to try to piece things together, to look at what the freshman experience was and to ask what students had expected it might be.

Between what it was, and what they had expected, there seemed a marked dissimilarity. The freshman year looked

> too much like the senior year of high school, too little like the image we had of a university; too much like a prolongation of adolescence, too little like the incoming student's image of the new world he had thought he was entering. Central in both his image and ours was a notion that college was a place where intellectually as well as socially you would be treated as an adult, where you would be free of contrived pressures and competition, where your thinking would be at once vigorously challenged and genuinely respected, where you could pursue understanding because you were eager to understand, where you might come to know better yourself, your world, and your possibilities, where by earnest study you would gain knowledge and skills, but where, also, by the same study, you could gain lasting insight into the nature, language and significance of the broad range of human concerns which the college represents. And it seemed to us that such insight might be particularly important to freshmen, who too often at Harvard, though they are urged to select a field of concentration early in their sophomore year, are juniors or seniors before they understand the real nature of the field they have chosen.

We considered what the college might do. What we were after, it was clear, was not an "honors" program. Whatever we proposed would have to have relevance to freshmen of many kinds: to the relatively quick and the relatively slow, to the relatively privileged and the relatively unprivileged, to the ordinary as well as the extraordinary student. It would have to do with the form and spirit of instruction more than with its level.

Many schemes were proposed:

> A freshman thesis, to be written by every student in the fall, leaving Gen Ed A to be taught intensively in the spring. Each student was to propose, early in the term, a topic -- any topic -- that intrigued him. The college was then to provide him with a thesis advisor (it was proposed that we should use selected seniors, under the faculty-aide program, as well as regular faculty) who would introduce the student to the resources of the university, guide him in the development of his thesis, and in general provide a personal link, in an intellectual context,

between the freshman and the university. It was our hope that by this device we might exploit the enthusiasm, which in some form every freshman brings with him, as a vehicle for engaging him in the university.

Freshman "tutorial," designed for the same general purpose as the thesis, but utilizing instead of guided individual studies an informal seminar on some topic of mutual interest to a member of the faculty and a small group of students.

Both because the lower-level General Education courses seemed often as profitable for seniors as for freshmen and because freshmen seemed in need of a course they could get their teeth into it was proposed that we abandon the sophomore ceiling of the lower-level GE requirement and suggest instead that every freshman take one GE course and one course not regularly open to freshmen.

A strong plea was made also for the abandonment of grades in the freshman year in favor of "honors, pass and fail."

And that the faculty-aide program, then in its first year, should develop new roles designed especially for freshmen.

In the course of deliberating on these ideas, the needs we had sensed, and hence our aims, became clearer:

1. To sustain and inform the focused commitments which some students appeared to bring with them.

2. To provide immediately, for students of all kinds, vivid and challenging introduction to some significant area of study. Freshmen, it seemed, were too often held on the outside looking in, preparing themselves to become knowledgeable in certain fields but too often failing to comprehend what the field or competence in it were or were for.

3. But live introduction to one field of study, though profoundly useful, seemed not sufficient. What often seemed more needed than anything else (and here live introduction to one area could surely help) was an introduction to the university. It had been suggested in our proposal for a freshman thesis that we might learn something useful by observing a characteristic endemic to education as conducted by the army.

> Confronted by an ignorant recruit and the necessity of training him to use and maintain its large and extraordinarily powerful recoilless rifle, for example, the army predictably will begin with a lengthy series of lectures on the assembly and disassembly of the weapon, its functioning, and its detailed characteristics. Eventually, after hours spent contemplating the operating lever pivot pin and its relationship to the snatch-latch-catch, and memorizing the width of the barrel lans and grooves, the bewildered recruit may find he has progressed to a constricted range where he is allowed to shoot at paper targets with .22 caliber bullets fired through a pump-gun barrel inserted for training purposes in the four-inch tube of the weapon. As often as not this will end the course and the trainee will go on to the next subject with a score on his training record but with if possible less interest in the recoilless rifle, and no more understanding of its purpose, than he had had at the start.
>
> Occasionally, however, a rebellious instructor will turn the procedure upside down and start the course off with a free-wheeling demonstration

on a "combat" range of the ultimate capabilities of the weapon, using the full range of ammunition and the most spectacularly expert crews available and inviting the trainees out of the bleachers to fire it themselves. When the noise has ended and the smoke and dust have settled the trainees take on the learning of assembly and functioning minutiae with despite the topsy-turvy sequence a perplexing degree of interest and enthusiasm.

The army continues to construct its training in traditional fashion -- "Period 1 -- Characteristics of the Breech Block" -- but it continues also to run confused investigations of training inadequacy. And occasionally some rebellious instructor still opens a course with gunsmoke and dust, and further confounds the investigation by the startling success of his training.

The ultimate capability of a college education lies in its provocation of intellectual zest and broader awareness and understanding. But a startling number of inspirable freshmen get stultified at the snatch-latch stage, or come inspired by rumored capabilities and somewhere in the mire of an oppressive schedule and uninvolving study lose a begging enthusiasm.

There is too little explosion in the freshman year. The first experience a freshman has should be a demonstration, accomplished somehow, of the ultimate capabilities of his college years -- a vigorous demonstration of intellectual zest, and of rigorous and honest inquiry, an elementary proof that these things exist and can have meaning for him.

Speeches at registration time seemed not enough. Freshman advisors seemed often not enough. The place to which freshmen look, more than to any other, for their definition of the university and their place in it, is the curriculum. It seemed that we would have to provide there, operationally, the opportunity that seemed needed: for freshmen, and particularly for those who come to college unignited, to get their feet on the ground in the Harvard context, to begin to see what the university is about, and to begin to place themselves in it.

4. And there seemed a need, finally, to provide in the freshman year better opportunity for intelligent decision as to field of concentration. On the face of it choosing a field seems a tolerable enough task. The requirements of most fields are not terribly restrictive, and there are anyway courses to spare (though freshmen often do not believe that there are), but the fact is that in the minds of many freshmen decision as to concentration is inextricably bound up with decision as to career. The choosing of a field looks to many students like their last chance to make a free career choice. Important therefore, if in part only to their state of mind, tooffer basis for intelligent decision.

In May of 1959 Dean Bundy, with the approval of the CEP, asked for a proposal designed to test whether these needs were real and could be met. He gave assurance that there would be funds available for such a test.

"It is my conviction," the donor of those funds had said, "that within every entering freshman, within every entering freshman, there resides a potential for greatness which we have not learned how to develop fully by the kind of education we have brought to this generation from the generations of the past."

> I would dream that when a freshman enters the university he would become at once a member of a small group; perhaps of about ten men. He would be associated at once with a mature, established scholar whose first interest is the education -- I use the word in its broadest sense -- of this incoming group and of the ten who came here before....One of these ushers would meet each group of ten men as they came to the university. He would associate them with him as his colleagues -- junior colleagues, to be sure, but as men capable at once of behaving as men, capable of the greatness that I have described. He would help these young colleagues look over the university, talk over the professors, talk over the courses; he would start them reading, and then start them going to some lectures. And he would start each one on a personal research project. I believe each incoming freshman must be started at once on his own research project if we are to preserve his secret dream of greatness and make it come true.

We considered, in the months that followed, a variety of proposals, attempting to incorporate in a manageable experiment the best features of the ideas we by then had in hand: principally, the notion of the "usher," the freshman thesis, freshman "tutorial," and ungradedness. It was to be an experiment that somehow

> would place freshmen immediately in close contact with lively minds and significant questions. It would demand serious and intensive work, but by some other means than the threat of grades. It would be a place where the thinking of individual students, from different backgrounds and pursuing different courses of study, might be brought together and tested against the background of a common set of concerns. It would give vivid demonstration of the nature of inquiry and of a significant field of study. It would ignite curiosity, encourage commitment, command honesty.

We considered at length the possibility of relinquishing to individual members of the faculty entire responsibility for the freshman year of small groups of students. The students would comply with the spirit of the normal requirements but would satisfy them in whatever way seemed best to their faculty advisor. The freshman intending to concentrate in English might enroll in one course in that area and audit another, might satisfy the lower-level GE requirements by the work of carefully selected departmental courses or GE courses, he would be encouraged to explore seriously areas in which he was ignorant or unconfident, and as a principal focus of his year's work he would participate with the rest of his small group of freshmen in an intensive seminar on some academically significant topic of interest to both the students and the faculty advisor. His grades would be submitted to the advisor rather than to the Registrar, and the only official record of the year's work would be a report from his advisor that he had completed satisfactorily, by conventional means or otherwise, "the following requirements for the degree:." The proposal sought to introduce the freshman to the university by placing him in close touch with a stimulating teacher and adapting the ways in which requirements were to be met to fit more closely individual needs.

By the time the proposal had reached the faculty, it had been pruned and made more manageable. However it still preserved the "usher" notion and the principles of accepting equivalent work in GE, of encouragement to work in untried areas, and of gradelessness. But we reduced the scope of the experiment from the freshman's full program to a maximum of two credits and concentrated our attention on what might be accomplished by the "seminar" device.

We preserved also our conviction that if the experiment were effectively to meet freshman needs it would be obliged, like General Education, to retain a function and identity distinguishable to a large degree from those of the departments:

> It will not be the central goal of the program to offer specialist training -- presumably many of the students will eventually major in fields unrelated to the content of their freshman seminars. The concern of the seminars, though their identity may derive from quite focused projects, will we hope be more with general education than with specialization, more with total intellectual attitude than with professional preparation.

The faculty passed the legislation, and a one-year experiment began.

We offered, that fall, twenty-one seminars, led by faculty from thirteen departments and accommodating 202 students. The concerns of the seminars ranged from drama to metallurgy to the nature of the immigrant community in America. Their forms were equally various.

The CEP examined the results of the experiment in the spring of 1960 and concluded tentatively, on the basis of the response of faculty and students, that "as a whole" it had been "highly successful." Having specified a number of problems that would need close attention if the seminars continued, and reducing the maximum credit allowed from two, which had rarely seemed useful, to one, the Committee recommended that the program be continued, on an experimental basis, for an additional three years. Its recommendation was accepted.

In the four years ending June '63, the program will have offered 130 seminars, accommodating 1132 students and providing approximately 1845 "student-terms" of instruction. (see page ii)

What have the seminars been?

With regard to substance it is possible to distinguish, very generally, three kinds of enterprise. Some seminars aimed to provide "committed" freshmen early experience of advanced and adult work within a specialized field. Such, for example, was Donald Menzel's seminar on the growth and behavior of sunspots. A second kind of seminar examined the nature of a broad area of inquiry by treating in depth a sharply focused but representative subject. Clyde Kluckhohn's seminar on the Navajo Indian was an enterprise of this kind. And there have been some seminars, finally, that set out to demonstrate the nature of a wide area by considering, from the start, broad questions. Such were the seminars directed by David Riesman, which ranged through literature, philosophy, anthropology and psychology to study the relation of the individual to society.

The typical seminar has engaged 8-10 freshmen in a common inquiry, drawing increasingly, as the inquiry's context and shape gained clarity, on individual, independent work. Some have proceeded from broad initial questions to a variety of sharply focused inquiries; others have proceeded from a "narrow" inquiry to a variety of broad questions. All have sought to associate freshmen, through a serious intellectual enterprise, in a close, provocative way with an interested scholar.

Typically, the seminars have met once weekly, generally for 2-4 hours in the afternoon or evening. Some of the seminars' meetings have been directed largely by the seminar leader; others, in outward appearance at least, to a large extent by the students. The nature of the students' work between meetings, on which increasingly as the year progressed the meetings themselves have generally been based, has varied greatly with the nature of the seminars. Often it has been carried on in the laboratory, often in the library, sometimes in the student's personal reading and reflection, sometimes outside the university, in the streets of Cambridge or Boston or in the museums or at the State House or wherever an inquiry has led. In almost every case, in the organization and execution of individual work, substantial initiative has been demanded.

Most students have written extensively (and though we have strenuously avoided any such goal for the seminars, a good many have published papers). Their work has not been graded in any way, but a few students who have failed to take their work seriously have been excluded from their seminars or denied credit.

Because the seminars have depended so much on the interests and style of the seminar leader it is hard to give a valid general description of their substance or activities. Individual accounts of the seminars that have been offered may be found in the Appendix.

A few things can be said, however, about the general characteristics that have had most to do with the seminars' shape and impact:

1. They have utilized inquiry in depth

    a. as a means of demonstrating the nature and methods of a significant academic area;

    b. to provide opportunity for the student to discover what scholarly inquiry in general is about -- the kinds of competence and imagination and discipline and honesty it requires;

    c. as a means of taking the student quickly to a level of inquiry at which the interdependence of fields becomes clear and inescapable; and

    d. to give early opportunity for the student to test strenuously his academic pre-dispositions.

2. They have sought, by associating the student in an intellectual context closely with a member of the faculty and a small group of students

    a. to give live, close demonstration of the ways in which an educated mind approaches intellectual problems;

    b. to provide a mobile vehicle for pursuit of investigations;

c. to make it possible to tailor instruction in such a way as to provide each student, and the group as a whole, maximum challenge;

d. to encourage students to learn from each other; and

e. to provide for self-examination and self-discovery a supportive context appropriate to the intellectual aims of the university.

3. They have been voluntary and gradeless, and they have been independent in their identity, by and large, from field requirements and the departments.

Who has led them?

107 members of the faculty have led seminars,[1] some for one year only, others for several.

59-60	60-61	61-62	62-63	total
32	48	45	42	107

In each year since the first, there has been a turnover of faculty, and thereby of seminars, of approximately 66%. That turnover reflects in part our determination to preserve the vitality of the seminars and of the program:

In the first place the seminars have in most cases been built on what seemed to the leader, for the purposes of the seminar, the most appropriate formulation of his own interests in his area, so presented as to engage the students in live inquiry. That kind of instruction, though almost inherently fresh the first time, may be difficult to make fresh the second.

In addition the seminars have sought to teach, to a significant degree, through a kind of relationship between teacher and student that is demanding of affect as well as of time and energy. The effective lecturer must thoughtfully manage the relationship of his material, through him, to the class; the effective seminar leader must keep creatively in control not only that relationship but a demanding and inevitably somewhat personal one between himself, schizophrenically as teacher and as participant, and each member of the seminar. That costs. Some seminar leaders who have enjoyed one year of this have been explicit about their unwillingness immediately to resubject themselves to such teaching. (There have been many others who have thought it required a year's experience to do the job really well. This has been particularly true in cases where the seminar leader has undertaken a wholly novel approach to a field.)

---

[1] This does not include unlisted assistants or 'directors' not themselves leaders of seminars.

Finally we have felt, with some evident justification, that it would be easier to recruit excellent seminar leaders from the ranks of a research-minded faculty if they could feel assured that their commitment to the program was not a life sentence. Thus we expected from the start that the make-up of the program would change significantly each year -- in fact such strength as the program has had seems to have resulted in part precisely from this annual reincarnation.

Turnover has also resulted sometimes from disappointment -- of seminar leaders with this approach to teaching in their areas, sometimes of seminar leaders with themselves as teachers, occasionally of the program with the seminar leader. In these cases, as in general, the visible principle of change has seemed appropriate and useful.

Of the 107 members of the faculties who have led seminars, 15 had not regularly taught in the college. Three had held non-teaching appointments in this faculty, 9 came to the program from other faculties, one is a member of the Radcliffe Institute for Independent Study, one is Curator of the Nieman Fellowships, and one had at the time he was proposed as a seminar leader no connection with the university. (Eight of the fifteen are leading seminars for the first time this year. It may be worth noting that of the seven brought previously to the college by this program, five have now been asked to stay on in teaching positions unrelated to the seminars.)

In the course of the four years 63.2% of the students have been in seminars led by senior faculty,[1] 36.8% in seminars led by junior faculty. In the first year, when twenty-one seminars were created in four weeks, no attempt was made by those responsible for their creation to consider as prospective leaders any but those prominent members of the faculty whose names came most readily to mind. By the third year of the program a significantly larger number of junior faculty were involved. This year the balance has shifted back. A further discussion of that balance and its implications follows in chapter V.

---

[1] Professors, Associate Professors, senior lecturers or the equivalent.

Who enrolled?

A pamphlet describing the seminars for the coming year was sent each summer to incoming Harvard and Radcliffe freshmen. All who were interested were invited to apply. Their letters were collected by the program office and sent on to the seminar leader in the fall with background information from admission records. Almost every applicant had an interview, upon arrival, with the seminar leader, who then, in those cases where too many had applied, used whatever criteria seemed to him appropriate in selecting the participants.

Students' reasons for applying have been unsurprising. The common denominator has been a feeling that such instruction was something novel and might be enjoyable. They liked the idea of working without grades. "The freedom of the set-up fascinated me. It was unbelievable to me that educators would go so far out on a limb, and expect work from students under no compulsion whatever." Basically the seminars were "something different."

A few applied also because they knew something about a particular seminar leader and were excited by the opportunity to work with him. Some applied because of an informed, pre-existing interest in the concerns of the seminar. Many others were intrigued by the sound of a proposed inquiry into some area that seemed wholly foreign. "I remember that at the time it seemed that the description rang with Miltonic dignity! The investigation of 'the freezing of water and the melting of ice' struck my imagination because it described so familiar a thing as water in such an unfamiliar manner."

In almost every application there was some such mixture: attraction to the style of instruction, a feeling that this was what Harvard was supposed to be, and either an uninformed curiosity or a more or less informed interest in the substance of the seminar. Some, inevitably, applied primarily "because this seemed the thing to do" or because "gradelessness promised a way to slack off." These have been a diminishing minority.

The seminar leaders, in a majority of cases, had too many applications and were obliged to select. Their criteria, different in every case, depended upon their temperament and on their conception of the purpose and demands of their seminar. Some sought primarily interesting diversity of background (and discovered that relative to other things geography is unimportant). Others attempted mainly to gauge seriousness of interest. Some were concerned mainly, and necessarily, about academic preparation. Others sought a representative sample of the class.

In four years approximately 1900 students applied, some to more than one seminar. 1132, or 60%, were admitted to one seminar or another. But because some of those students who had applied during the summer eliminated themselves in the fall, and because a few seminars attracted 70 or 80 applicants, the figures here are misleading. The "typical" seminar leader was obliged to exclude roughly a quarter of the applicants.

Those who applied and finally enrolled were somewhat "brighter" than their classmates and came slightly more often from public schools.[1]

	PRL 1.0-1.9	2.0-2.9	3.0-3.9	4.0-4.9	5.0→
seminar	2.0%	44.8	45.7	7.5	
college (class of '64)	1.6	31.6	49.4	16.6	.8

	public school	private school
seminar	59.4%	40.6
college (class of '64)	56.2	43.8

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[1] These data, and those that follow in this report, are based on the experience of the 810 students who were enrolled in the seminars in their first three years and who now are sophomores, juniors and seniors. Current freshmen are not included.

Dean Whitla's study of PBK seniors cites the frequency with which those students had stood at the top of their high school class and suggests the importance, to that kind of college success, of academic competitiveness. The seminar students, though a number have gained admittance to PBK, are not as a group distinguished in that way:

	percentile rank in high school class					
	10-49	50-69	70-79	80-88	89-95	96-100
seminar	1.4%	4.4	5.2	10.8	54.7	23.4
control group[1]	1.3	5.6	5.2	10.9	56.0	21.1

They differed, however, in the amount of thought they had given "before coming to Harvard or Radcliffe, to what college was like, and for, and to what you might do there."

	seminar	control
Relatively little -- it was simply the natural next step.	29.0%	32.2
I studied the literature and tried to figure out the requirements, but without a great deal of thought about my purposes, or the college's.	34.7	38.9
I did a good deal of soul searching, and serious planning.	36.3	28.9

Application to a seminar may reflect a habit of venturesomeness and earnestness that appears also in the fact that these students applied to this college.[1] They came less often than did the control group from families accustomed to prestige colleges:

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[1] A non-seminar sample of 796 Harvard and Radcliffe students matched with the members of the first three years' seminars on the basis of college class, the area of concentration they proposed at the time of admission, PRL (predicted rank list) (or, for Radcliffe, verbal aptitude score), and whether they had attended a public or private secondary school. The validity of that control group is examined in the Appendix.

father's college

	Harvard Yale Princeton[2]	other[2]	none
seminar	11.5%	71.3	17.2
control	15.2	70.0	14.8

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[1] and which incidentally, if it does significantly differentiate them from their classmates, imposes a built-in limitation on data concerning the control group (composed inevitably of people who for the most part did not, as freshmen, apply to a seminar)

[2] with some embarrassment about the fact that this is the way the college organizes data on this subject

II. EVALUATION

It seems clear that this program has met some needs in the freshman year. The evidence comes from the Freshman Dean's office, which notes a more positive and rapid connection, by many students, with the university. It comes also from the admissions staff, which notes in all sorts of schools, as a result of the seminars, an increased excitement about Harvard College. And it comes principally from the faculty and the students who have participated:

What have the seminars accomplished, in terms of the program's stated aims?

1. to sustain and inform pre-existing commitment

We had at the start been very much concerned about the student who came to Harvard College with a strong and advanced interest in a particular field, who by his own initiative had got deeply involved in the concerns of that field and who on coming to college found himself in courses that neither offered much depth nor asked initiative or involvement. We had seen cases where this experience not only had been hard on morale but had seriously undermined a potentially fast and durable engagement in the life of the university. By offering, in some seminars, opportunity to sustain that initiative and interest while simultaneously carrying on essential course work, we had hoped to capitalize more effectively the strengths of a great many incoming students.

We were to some extent wrong. The evidence, in the first place, is that though the exceptions are very visible, relatively few students bring to Harvard such commitment. 39.1% of seminar members (compared to 32.2% of the control group) report that they came to college with "relative to most other entering freshmen an exceptionally serious and well-informed interest in some particular field of study," and 73.2% of that group entered a seminar in the area of their special interest. But "special interest," at Harvard, only sometimes means commitment, and the reports of these students, as well as of the 71.4% who brought to their seminars no relevant "precocity," suggest that this need, and this function of the seminars, was relatively less important than we had thought.

Four reasons for this are apparent:

1. Harvard and Radcliffe tend to attract students from a mobile segment of society in which vocational, and hence academic, commitment tends to be deferred. Indeed it is part of the announced aim of such colleges to provide opportunity for discovery of one's interests as well as for their development. In fact, in the freshman year, uncommitment is valued -- if not by parents at least by students and quite audibly by the college. MIT gives demonstration that where the disposition of the students and the community is different such a program meets a different need. MIT's freshman seminars, though patterned after Harvard's, seem to have achieved as principal success what has in Harvard's program seemed secondary: the sustaining and informing of pre-existing commitment.

2. By university standards such substantive precocity as students bring with them has rarely seemed intelligently exploitable. Their enthusiasm has been exploitable, but their command of a significant field of inquiry has often seemed ill-grounded or too special to build on if that construction was to be a seminar's justification.

3. In those exceptional cases in which students have brought with them a mature and well-founded competence, exploitation of that competence has often, especially in the sciences, not required a seminar. The seminar program has served usefully to encourage departments to create opportunity for such students, and it has made that opportunity visible early, but in fact a number of departments, without the seminars, had long been hospitable in this way.

4. And again with regard to substantive "precociousness," much of the function of the seminars as we defined it had earlier been taken over by advanced placement.

There have been students, of course, who have come with single-minded purpose and found in a seminar exercise for a professional preoccupation that had long since left behind questions of choice and commitment. And where they have known themselves well the opportunity has been invaluable. The physics student who wrote, almost arrogantly, that "I am definitely, for better or worse, a specialist. I have been for at least six and probably sixteen years, and I will continue to be one," knew himself adequately and is now on his way to a distinguished career in physics. But most of the freshmen for whom we hoped to provide opportunity of this kind have been far less confident of their academic predispositions and have used the seminars less to sustain commitment than as a means of "checking it out."

2. to provide, vividly and early, a widely relevant introduction in depth to a significant area of study

Freshmen rightly want not only to know about the areas of study offered by the university but somewhat to comprehend their essential nature. Not only "What is known about chemistry, or philosophy, or history?" but "What is its significance? How do we know, and how does what we know here relate to other knowledge? What kinds of things are yet unknown? And why does anyone bother?"

> To me the whole point of the seminar is not really what is taught academically, but rather the insight gained into what goes on in a field. Even a freshman can grasp this eventually, and it is what he wants most to know. (S)[1]

The conventional course may often, to a remarkable extent, provide such insight -- especially if it is taught by someone who visibly embodies the spirit of the field. But the conventional course, because it is committed to cover an extensive body of material, operates at a disadvantage. And even the "post-hole" approach (dig here for a while and then skip on and dig again), unless masterfully handled and augmented by opportunities for individual investigation may often seem a frustrating drill.

It was a thesis of the seminars that precisely because there is in every area so much to be known we should offer immediate and vivid demonstration of the nature of the area, its relation to other areas, its bases and its methods and demands and limits -- lest in the busy and essential process of learning about the field the student fail to discover, or discover too late, what the field, or he in it, are about. By sacrificing coverage and the artificial neatness which coverage may necessitate, and by entangling the student in the work of the field, we had hoped we might enhance both understanding and motivation. The seminars were in no sense to replace departmental courses; they were, ideally, to heighten their impact.

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[1] Quotations from students and faculty are identified hereafter by (S) or (F). Quotations from General Education in a Free Society (the "Red Book") are identified by the notation (GE)

> Compared to a regular course, I didn't get as much systematic knowledge, but I got a better understanding of the knowledge I did get, and a better basis for future study. (S)
>
> The seminar has been invaluable in giving me an understanding of just what is meant by the "it has been determined that" phrase that so often appears in the texts. (S)
>
> One can get the subject matter of a course from a book, but one can get contact with historians and guided experience in the historical method only from the seminar. The sooner one gets such experience, the better. Compared with my greater understanding of historians, my increased knowledge of the specific fields studied -- the Norman invasion, St. Anselm, and Magna Carta -- is of secondary importance. (S)
>
> I now recognize much more clearly the problems inherent in any sort of scientific investigation; similarly, I recognize the traps into which an enthusiastic investigator, anxious to demonstrate a hypothesis, can fall. This approach has pervaded all of my other work this year. I find myself far more critical of my own analyses. (S)
>
> In few of the lower-level courses is a real insight into the area provided. A general study is made, but that may serve mainly to alienate a student, because he feels that the work in that field is lifeless. (S)
>
> I would say that the seminar has speeded up the process of first broadening, then focusing, my interest in astronomy that would have come otherwise only after I'd had the chance to take several more courses. (S)

We had been concerned that such experience might lead freshmen to conclude that scholarship is easy, that the hard and orderly study required in most fields is superfluous and beneath their dignity. We worried, in other words, that well-meaning seminar leaders might be overly protective, might strew roses along the path of scholarship so as not to frighten their students. We can find no case in which this has happened. Students who came with visions of roses have been disillusioned, and those who came without preconceptions have in most cases gained respect for both scholarship and the orderly and rigorous study which scholarship pre-supposes.

> The seminar made Harvard and my freshman year very exciting. It gave me a view of the world and the problems inherent in making the world better. It told me how LITTLE I really knew about those subjects in which I previously had considered myself well-versed. (S)
>
> More important than anything else, perhaps, I have learned how very much I have left to learn. (S)

Finally, it had been objected that regardless of the possible merits of such instruction it would be impossible to devise inquiries, manageable by freshmen, that would validly represent adult scholarship. The experience of four years has demonstrated, instead, that the supply of appropriate topics is unlimited. An appropriate field of inquiry appears to have many of the following characteristics:

1. Its general direction and significance can be made quickly intelligible, at least at a superficial level.

2. It fairly accurately represents the kinds of investigation with which the area in general is concerned.

3. It requires increasing command of the methods and language appropriate to the area.

4. It demands grasp of a variety of the basic principles or concepts on which knowledge in the area is constructed.

5. It fairly quickly reaches a level at which the interrelation of different disciplines and perspectives becomes evident and important.

6. It leads neither to cheap satisfaction nor to the unrelieved monotony that may be tolerable as a phase of a longer inquiry.

7. Its physical requirements are simple, or at least readily met.

8. It is not so restricted that the seminar leader is the only available source of information and perspective.

9. If initially broad, it suggests sub-investigations appropriate in scope to the term of the seminar and having characteristics, as above, similar to those of the larger inquiry.

The most important of these characteristics are a part of the nature of scholarship. It seems that the rest, with thoughtful foresight, are attainable.

3. "general ignition:" to afford the student opportunity to discover what the university is about and what his possibilities are within it.

What seemed to be needed by many students, more basically than introduction to an area, was a sense of engagement in the life of the university. We had hoped that the seminars might provide such students, within the curricular main context of the college, better opportunity to come to terms with themselves, and with themselves in the university; that the seminars might enhance self-knowledge but simultaneously self-confidence, that they might ignite curiosity and with it personal motivation, that they might establish both respect for formal learning and a habit of self-education.

In these respects, the seminars often have failed utterly. In other cases, as the data on withdrawals from college will suggest, they have fallen short of, or over-shot, the mark. But for many students, especially in the humanities and social sciences, they have been evidently and dramatically successful:

a. self-knowledge: dislocation and location

There is a "culture shock" built into the freshman experience that is cause equally for concern when it occurs and when it doesn't. It is a part of the nature and greatness of this institution that it commands the student to "reflect on his beliefs and criticize his presuppositions," but too often that command goes unheeded or unheard -- sometimes for four "creditable" years. On the other hand when it is heeded, when the student begins to question his preconceptions and his definition of himself, he too often fails to find in his intellectual experience in the college place, encouragement or materials for reconstruction. The institution, perhaps inevitably by its nature, facilitates more effectively "analysis, doubt, criticism and distrust" than "synthesis, faith, creativeness and trust."

> I think there is a certain danger in taking an individual the way Harvard does, and I guess most of the colleges do, and throwing him in this huge threshing machine and cutting off all his roots and then there is nothing else that he has. (S)

One's early years of scholarship are especially destructive. It was our conviction in creating the freshman seminars that because it is committed to education as well as to scholarship -- and to the education of many who will not go on as scholars -- the university had an obligation to provide for self-questioning both a provocative and a constructive setting. And two further convictions: First, that because the university speaks to its students most effectively through intellect and the curriculum that setting should be, first of all, curricular and intellectual. Second, that if maximum benefit were to be gained, special attention must be given freshmen.

Self-knowledge is not something that is achieved in one year -- or in four. But there are few things one can profit from as little without it as from a liberal education -- important therefore that the quest be at least begun, and begun early, in college. Especially in this college, which by refusing to direct its students into specific occupations obliges them to come to terms with themselves first, before taking on vocational roles.

The seminars seemed a way of providing early and vividly, by a single device, both unevadable challenge and a supportive setting. Not a way of providing answers, but a context in which questioning, if successfully provoked, might have positive effect.

Though the fine line between emancipation and alienation has at times eluded seminar leaders and students, the outcome in general has been good:

> [From a student who had entered a seminar at midyear] - This evening was the first time since I've been at Harvard, as a matter of fact the first time in all my education, that a discussion of very basic, and certainly complicated, issues has been completely non-pedantic and non-competitive and non-this-is-what-I've-read, and at the same time more than just an analysis of material, which discussion becomes in most courses. . . .What I see most clearly about myself, and I never realized it before, is that I have never really learned to think originally. I have learned, through competent schooling, to analyze, to study, to think and imagine on points which are already suggested to me. An hour after my first meeting, I have suddenly realized that most of my thinking processes have been development, interest, enlargement, or even repetition, of someone else's ideas. . . .I have always said "Think for yourself," but it has taken a seminar full of people thinking for themselves to show me that I was not carrying out my maxim. I don't know whether the seminar helped in this sort of thinking or whether the members of the group thought this way before. At any rate, underneath whatever this seminar has to give to me and I have to give to it, I have a small personal project of trying to think for myself. (S)
>
> In short, the seminar has done what no other course at Harvard has even attempted to do (or could be expected to attempt) -- it has made me stop and think about what I'm doing with myself, instead of letting things happen in their preordained fashion. (S)
>
> The kind of instruction involved in this seminar is not really any kind of instruction at all but an undoing of all instruction to see what lies beneath presuppositions and thinking. (S)
>
> It had never before occurred to me that everybody didn't like Ike. (S)
>
> It has made me decide that the most important thing in life is for one to be himself and to know himself. Then, everything else becomes important. (S)
>
> The seminar was extremely worthwhile, both for the astrophysical knowledge, and for the self-knowledge. (S)
>
> My friends in that seminar were given about a two-year jump in awareness of issues concerning self and Harvard. Many seniors are now making comparable

> discoveries; others, tragically, never will. (S)
>
> What has been most meaningful to me is that the seminar, with all its enthusiasm, its spontaneity, its profound seriousness at times, its frankness, its honesty, its acceptance, gave me a chance to sweep away some of the cobwebs. It gave me not direction but directed confusion. I feel different inside: not more confident, rather more aware; not rebuffed, only more challenged. I have never felt so accepted by a group, so respected for my merits, so able to accept and respect others. ________ had a way of opening up, of expanding, of relating, of catalyzing that guided me from my prep school New York world into the world of a university. (S)
>
> While my ideals and attitudes have been evolving in a way consistent with the seminar, it is virtually impossible to establish firmly a causal relation. I can say, however, that this is the first single "course" I have ever taken in connection with which the possibility of such a relation could be seriously considered. (S)

b. self-confidence, and motivation

Every freshman has some reasons and need for confidence in himself. Perhaps more need now than earlier.

It has not been the function of the seminars to provide self-confidence. They have sought rather to provide a setting in which the student might discover, intellectually, meaningful basis for confidence. Every student brings with him a deep-seated, if often sub-conscious, conviction that he has some inherent worth. The colleges have rarely killed that conviction. But they have sometimes failed, by the manner of their teaching, to respond to its manifestations, and by failure of response have suggested to the student that his worth is inconsequential or out of place.

> The college student . . . cannot express his worth to anyone through his work. . . . The role of the student seems worthless. He is denied any sense of confidence, competence or autonomy. . . . He is not producing; he is consuming. . . .He feels impotent and insignificant. . . . He has created nothing for the consumer in his paper on James Joyce. The paper has little weight and it wields no power. Few people see his work or his grade. There may be, in fact, a feeling of real embarrassment when an individual considers his sense of elation upon getting an "A", or depression upon getting a "C". "How foolish and stupid my life is," he thinks, "that such a small, meaningless letter could be of such importance." Any feeling of unique power he may have had in mastering an academic task is lost in the awareness of the countless others performing the same task. He sees himself in every face on campus as a nothing, busy with lifeless words. (S)
>
> What do I mean by saying that a man [entering college] is treated as a boy? I mean that he is told, the moment he arrives, that his secret dream of greatness is a pipe dream. (Edwin H. Land, "Generation of Greatness," Alfred Dehon Little Lecture, MIT, 1957.)

> The justification of all teaching to some extent, and of this kind especially, is in the premises of the democratic way of life: teaching is important because the human being has value in himself -- not as a potential scholar, but as he actually is with his actual capacities and limitations. (GE)

> I believe that each young person is different from any other who has ever lived, as different as his fingerprints; that he could bring to the world a wonderful and special way of solving unsolved problems; that in his special way, he can be great. Now don't misunderstand me. He will not be able to bridge from field to field. He will not have the ideas that shorten the solution of problems by hundreds of years. He will not suddenly say that mass is energy; that is genius. But within his own field he will make things grow and flourish; he will grow happy helping other people in his field, and to that field he will add things that would not have been added had he not come along. . . .(Land, ibid.)

To "help young persons fulfill the unique, particular functions in life which it is in them to fulfill" and to "fit them for those common spheres which, as citizens and heirs of a joint culture, they will share with others" (GE), are not separable tasks. If we wished to do them separately we could not -- not efficiently or well. The seminars seemed a place where, in working toward the second goal, the first might also be approached. It has been approached, in four years, very often.

> He criticized without discouraging me -- instead gave me great faith in myself and taught me that I could think. (S)

> The idea that people have confidence in the freshman's ability and seriousness helps to restore some of the will, self-confidence and pride in accomplishment that a senior in high school is liable to lose as he becomes a college freshman. (S)

> It has given me hope that creativity can be achieved -- and in relatively sane surroundings, not only in lofts and cellars. (S)

> My feelings based on my own seminar and experience with students in the seminar last year make it very clear that the freshman seminars have been a major force in saving a large number of students from a very total kind of apathy that one often finds in the undergraduate body at Harvard. They are a very remarkable group of students, and I'm vastly pleased that they have the opportunity to develop and express some of this remarkability before the less productive demands of the system begin to erase it. (F)

> I came to Harvard with a poor background in every field. I had thought about little, had never thought about any significant intellectual issues. I knew little about the purpose of college, or of education. In all honesty I did not know what it meant to "think." The seminar, from the first, captured my interest and taught me how to think. Also, it gave me many fascinating things to think about. I watched and listened to the seminar leader and the other students, seeing the kinds of things they said and thinking about the questions they brought up. Gradually, very gradually, I came to feel that I myself had some ideas which I could contribute to discussions without feeling self-conscious. (S)

In a few cases students concluded that they had found through their seminar real challenge and real meaning, and that in the Harvard education as it was offered to undergraduates there was no place for these things or for themselves. A small band of such freshmen at one point proposed to remove themselves from the university and create for a year, close by in Cambridge, a higher education of their own.

CONFIDENTIAL

SPECIAL SEMINAR: PROSPECTUS

IF you feel that your courses are getting in the way of your education,
IF you feel that in order to get satisfactory grades in your courses you have been unable to draw what you want from what Harvard has to offer,
IF you feel hemmed in by concentration requirements,
IF you want to study what's meaningful to you,
THEN you may be interested in this proposal.
Read on.

WHAT IS PROPOSED:

A "seminar" group of 6-12 students, something like the Harvard freshman seminars on "the individual and society," but extended in scope and depth. It will be aided by at least one Harvard faculty member, probably by more.

Each participant will determine what he does -- independent reading or research, auditing courses, etc. The participants together will determine the nature of the seminar -- what kind of meetings, how often, subject matter, group readings, etc.

. . .This special seminar cannot be established within the official framework of Harvard University. Participants will be taking a one-year moratorium. (Harvard willingly grants temporary leaves of absence.) There will be no "credit." Living arrangements in Cambridge will be made by the group. It is expected that overall costs will be considerably less than for an enrolled student. There will be sufficient time to work to earn money. Participants will be able to take advantage of nearly all the facilities of Harvard -- lectures, faculty, libraries, and other benefits of the "academic community."

. . .This special seminar is open to college students, both men and women. (It is expected that students who are sophomores or freshmen this year will predominate.) Because it will not be established within the official framework of Harvard University, all participants do not have to be enrolled now in Harvard or Radcliffe.

IMPORTANT NOTES:

--ALL this is tentative -- subject to the wishes of the participants.

--Because of the unofficial nature of this program, this information should be kept confidential. Please do not contact Harvard University about it.

The unfortunate thing about that proposed adventure is that it never occurred. It would probably have been an instructive year. Its principal instigators instead stayed on in the College and although one eventually took a leave of absence both are now in residence and Group II.

The self-confidence achieved by most seminar students has resulted in more modest entrepreneurship:

c. engagement in the university

> By the beginning of the second semester, the students had discovered that they could enjoy Harvard in a new way. A number of them started auditing courses; in fact a number audited several courses, at first, by way of choosing those which would be profitable and stimulating; and if they could not audit all the courses they wanted to, sometimes they rationed them out among themselves so that some could audit some and others others and then get together and discuss what they had learned. (F)

"More than anything else I have done, the seminar has made me feel a part of the university." This was a major goal of the seminars: as one student reported, "to generate an atmosphere of intellectual hunger" and encourage the student to exploit imaginatively the resources of the university.

It is clear from their reports that for at least some students the effects of this naturalization have gone beyond the curriculum. They have felt freer to pursue extracurricular interests[1] to which they previously had feared they could not risk commitment. The evidence speaks more often, however, of a gradual but sure engagement in the curriculum itself:

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[1]

a. In the seminar group more students report serious participation in some extra-curricular activity than report "didn't so participate and wish I had."

In the control group: vice versa.

b. In comparison with the control group seminar graduates appear relatively frequently under the headings "literary," "scientific," "PBH/social service," "international affairs/peace," "drama, music and other arts." Relative to the control group they appear infrequently under "athletics," "student government," "publications, not especially literary."

> I was skeptical at first about the possibility that the students would profit as much from a seminar as from a full course, but these doubts slowly disappeared as the year progressed. It seemed to me that in the seminar the students had an opportunity to become deeply and maturely critical of problems which, although interesting in and of themselves, were valuable primarily because they served to make the students aware of the way scholars think, and the fact that they themselves could be scholars, and also because they showed them how exciting scholarship can be. It was exceedingly rewarding to watch this awareness and this sophistication develop. They reached levels which students in the usual courses never, in my experience, attain. . . .It has been an exciting privilege to teach in this way.(F)
>
> I don't think that the increased academic background gained from a regular course sufficiently overshadows the increased maturity a freshman will gain from a seminar. I may not have learned as much physics in my seminar as I would have if I had taken Physics 12a, but it did help me more than an ordinary course would have to have a more mature outlook on college. (S)
>
> In spite of the fact that I had attended the University of Michigan for one term, participated in advanced placement courses at high school, and the like, I found the seminar a different type of intellectual and academic experience; one which I missed and one which I sorely needed. I was fine at learning a given body of material, digesting it and giving it back in a different form, but the work in the seminar made me think about the material of my education too, not simply absorb it. (S)
>
> I found that the seminar work, where responsibility falls on me alone (although with guidance from the seminar leader) made me grow up to responsibility much faster than my other courses. (S)
>
> It would never otherwise have occurred to me in my regular courses to do more work than the absolute minimum. (S)
>
> When I began the seminar, I felt wholly ignorant as to what history means to a scholar in the field. I did the reading, which was admittedly interesting, but obviously not directed toward a useful purpose -- or rather it was directed toward me and how I would come to terms with it. It didn't have to be memorized or studied for background for tests. But, as I studied Dr. ________ and how he approached an historical problem, and as I read deeper into the environment concerning the topic, I enjoyed each seminar meeting more. . . .And in working these past weeks on my report on the Indiana Separation, I have felt more confident that the seminar has been profitable. I have talked with brilliant historians and actually studied an historical topic from an original perspective. I have begun to feel just what history means to me. In narrowing my interest, I have explored a field, and myself also, a little deeper than I might have done in a Social Science course. Furthermore, I have come to terms with a course that counts for no grade and has meaning only for me instead of for the Dean's office. . . .In narrowing our focus, we have widened our grip on the intellectual content of education and have been forced to see ourselves in a personal relationship with it. (S)

d. self-education

This report [General Education in a Free Society] thus far may have seemed to

> conceive of education as solely a relation of student to teacher. Yet education is primarily self-teaching. The classroom is to show the student how to instruct himself and to save him time in his attempt. Its aim is to aid him toward enterprising independence, toward free curiosity, and toward persistence in self-learning.

The Government Department approved this fall, on petition by a group of upperclassmen for an unprecedented application of the college's legislation governing Independent Study, an intensive seminar investigation of the relation of the emerging European community to American foreign policy. "Perhaps this endeavor," one of the students wrote, "will express in some small way the spirit of the freshman seminar program and its influence on the intellectual growth of ten of its participants."

We have no other visitable data on the effectiveness of the seminars in stimulating self-education. We know, however, from our discussions with students and from such reports as the following, that more students than these ten have been effected.[1]

> I was told that I would be left on my own, but somehow I had the feeling that I really would be pushed and pulled as I had been throughout my educational career up to that time. And I wasn't. So at first I was thrown off balance, and drifted a while. But finally I realized that if anything was to be done, I had to do it. (S)

Finally, though it does not fit properly into the scheme of this section, we would like to note one further characteristic of many of the seminars:

> I do the assignment every time because it's fun. It's not work; it's pleasure. It's something I want to do. (S)
>
> It is the first academic situation in which I regained a sense of intellectual and social potency. Even during my most unproductive times in other courses it remained to remind me of the joy there can be in scholarship. These sessions were awaited with eagerness. (S)
>
> It is very refreshing to know that there are some parts of education which one can enjoy while one is actually in them, instead of having to wait till after the exam is safely over to be able to say "I got a lot out of that course." (S)
>
> I am worried about the work which I have left unfinished. (S)

---

[1] and the graduates of the seminars have made, in all, 70% more use than the control group of upperclass Independent Study.

4. to facilitate considerate choice of field

> A study of the Sacco-Vanzetti case transcends the narrow bounds of any single field of scholarship. (S)
>
> My seminar was specialized only in the sense that it dealt with a specific subject. (S)
>
> The seminars are specific, but they do not direct the student to their own fields. I am not at all inclined to specialize in medieval history, but now that I have done original work on specific problems, I can tell more easily what kinds of problems and academic methods I enjoy. (S)
>
> The seminar has been especially valuable for a number of reasons, only one of which is the actual knowledge gained concerning East Africa. Primarily, the value has been in the introduction to historical methods and scholarship. The problems of source material, the value of books, the use of Widener Library, the problems of interpretation, the problems of conflicting and insufficient information, the value of firsthand research, the concept of a "field" of study, and the nature of scholarship. The material itself has been fascinating and of incredible breadth. (S)

If a student was intelligently to choose an area of study, it seemed important a) that he understand what study in the university is about; and b) that he have a viewpoint within the university from which to examine his options. The seminars have sought, by and large, to provide both.

Graduates of the seminars who are now sophomores, juniors and seniors were asked last fall to rank their various experiences within the curriculum "in order of their usefulness in deciding upon a field of concentration." The control group was asked to do likewise. The results were as follows:

CON	SEM	
1	2	one of the introductory departmental courses I have taken or am taking
2	3	a 'middle-group'departmental course I have taken or am taking
3	4	a lower-level GE course I have taken or am taking
4	5	an upper-level GE course I have taken or am taking
	1	a freshman seminar

It needs to be asked, however, whether the seminars encouraged intelligent and free choice or simply solidified pre-disposition. The evidence suggests the former:

In the first place, in applying to seminars, students seem not to have played blindly from early academic strength any more than freshmen, generally, in their response to the curriculum. Of the seminar students who before the start of their freshman year had indicated their intention to concentrate in the natural sciences, 64.5% entered science seminars, 35.5% seminars in other areas. 62.4% of the students inclined toward the humanities entered humanities seminars, and 82.1% of those inclined toward the social sciences entered social science seminars. (The differences reflect in part the availability of seminars in the three areas.) This behavior does not seem out of line with the general behavior of freshmen.

> People will take courses that interest them whether regular courses or seminars.(S)

There have evidently been many students who purposely enrolled in seminars quite removed from their intended concentration:

> I'm taking my philosophy seminar just because I'm interested in the subject. I will not major in philosophy. (S)
>
> I value the seminar primarily as an opportunity to go with some depth into a field in which I have some interest but no inclination to concentrate. (S)
>
> The seminar introduced me to the study of art without requiring that I concentrate in Fine Arts. I intend to concentrate in Biochemical Sciences, so will never study such material in tutorial. (S)

Furthermore those who have been responsible for the design of the seminars have increasingly, with some success, sought "sneaky" subjects - "which though they appear to the student reassuringly familiar quickly involve him inescapably in areas, questions and ways of seeing which he had never known existed."

> I discovered a whole new world more or less on my own (though I recognize Professor ________'s guidance more and more on looking back). (S)
>
> I was introduced to an entirely new field, of whose existence I had not dreamt, and found that that field is wide and stimulating. (S)
>
> It opened my eyes to a whole new area, that of the social sciences, including

> psychology, anthropology, sociology, which I before believed to be really "silly" and which I deprecated and looked down upon. Nobody would have been able to convince me differently, but this seminar has. I am very grateful. (S)

Often, to be sure, and happily, students have entered a seminar in the area in which they had thought they might concentrate, had a hard look, and emerged committed.

> The actual material that I learned from this experience was not really the important factor, or even the skills which I learned, which I consider more useful in the long run. It was primarily the experience of being exposed as directly as possible to the kind of work which I intend eventually to do. I am sure that most prospective science concentrators wonder after they have taken a few formal courses just what it means to be a "scientist" outside of the classroom: how does one go about it? Is it really the sort of thing I would want to spend my life doing? (S)
>
> I think that the most important thing that I have gotten out of the seminar is the decision definitely to concentrate in astronomy. (S)
>
> I have always been interested in physics, and have a good aptitude in it, but, on the other hand, I have recently developed a strong interest in the creative arts. The seminar was precisely what I needed at this point, for it convinced me that my plans for majoring in physics were well-founded. (S)

[And, mainly because we can find no better place to include it:

> My knowledge of turtles has advanced and I believe that some of my research has advanced the knowledge of my associates and knowledge of turtle behavior in general.]

The intense and "special" presentations staged in some areas by the seminars have been sometimes criticized as unwarranted "recruitment." It seems to us that every student -- every adult -- is recruited by something to his particular work, and we find in the seminars no evidence of undue recruitment:

	pre-freshman expected area = area of seminar	area of seminar = present area	change
all students in seminars in natural science (213)	87.0%	75.3	-11.7%
" " " " " social sciences (358)	60.8	65.4	+ 4.6%
" " " " " humanities (239)	65.8	56.7	- 9.1%
		net "recruitment"	-16.2%

It seems that the effect of the seminars has for most students been broadening. Although two out of three have remained to concentrate somewhere in the area of their seminar, they have frequently, as a result of the seminar, done so with clearer and broader understanding:

> I should think that the seminar, more than any other single influence, helped focus my attention on a career in international law. Moreover, it narrowed my intended field of concentration from social sciences to government. Although interested in the subject, I had never been aware of the immensity of the field of foreign relations. The seminar had the effect of focusing my interests by broadening my perspective. (S)
>
> A seminar, at least my seminar, does not concentrate a student's attention, rather, it impresses upon the student the many different implications in many other fields of the work in one field and, conversely, the many influences of other fields on any single field. (S)
>
> Instead of being inclined to specialize, I feel like applying my new skills and methods of study to as many interesting areas as possible. (S)
>
> When I came to college last fall I had practically decided on English as my field of concentration. Perhaps because of a twinge of conscience after reading C. P. Snow's Two Cultures and the Scientific Revolution, I decided to take a seminar dealing with science. Now the combination of the seminar and Nat Sci 5 has changed my field of concentration to biology, although I still hope eventually to write. My outlook had been narrow, but the seminar opened up a whole host of new possibilities and ideas which, I believe, would have been difficult to gain through any other single course. (S)
>
> The seminar has served substantially to broaden my interests. When I began, I had a Jesuit notion that Freud was God and that all his detractors were heretics. Needless to say, this view has been highly modified. (S)
>
> The seminar challenged my naive preconceptions concerning political theory and practices. Once the illusions were destroyed, then we began learning. My whole attitude toward government has changed; I have come to see that there is more involved than I had thought. Therefore, I have changed my major to a broader field. (S)
>
> Rather than being a limiting experience, the seminar has shown me how intimately various fields of knowledge, particularly the social sciences and humanities are related. Due largely to the type of work done in the seminar, I have at various times during the year decided I wanted to major in government, economics, and social relations. My decision to major in history is based on the conclusion I now have reached that in history I will still be able to get a taste of all these fields. . . .I have had the invaluable experience of trying first hand, of testing, my desires, and of discovering whether or not they held up. Furthermore, in the process of confirming my early inclinations, I have also become interested in some other fields. The seminar was not, in my experience, narrowing. (S)

And for many students, though they remained in the same area, a seminar seems effectively to have demonstrated the importance of an understanding of other fields.

> It has made me realize that I need a much stronger background in math, physics, and electronics before I can tackle astronomy with any satisfying results. I have decided to major in math or possibly physics and perhaps to come back to astronomy later on. (S)
>
> It has broadened my understanding of the different approaches there are to

> questions dealing with people in society. It has given me a valuable background in this way for majoring in whichever of the social sciences I choose. Interestingly, I am also impressed for the first time with the real need to be acquainted with the special way of thinking with which the natural sciences are approached, and I am much more interested in taking science courses than I was before. This occurred because of the speakers we have heard and because I see now what happens when one deals only with evaluations, abstractions, and concepts and questions which have no absolute right answers. I feel that if I am to get more involved with this sort of thinking, I would like also to be aware of the realities of the other way, where reasoning and logic have the upper hand. (S)
>
> When I came here I planned to concentrate in chemistry in order to go into the teaching of chemistry. By doing advanced work I found that math is a vital tool to the chemist and I am hence majoring in math with electives in chemistry and physics in order to prepare myself for graduate work in some branch of theoretical chemistry. (S)

Finally there have been many whose experience in the seminars has served primarily to disillusion.

> If it were not for the seminar I would still treasure some fond illusions about writing and about myself as a writer. (S)
>
> I came to Harvard wanting to be a physicist. The seminar has shown me that the field does not have the appeal that I had thought when I was less familiar with its ideas and its methods of investigation. I am now seriously considering majoring in Slavic. For me, the seminar has led indirectly to the consideration of new areas of knowledge and has helped me to see the field of physics in a truer light. (S)
>
> My concentration plans are completely muddled presently and it is partly the seminar's fault. (S)
>
> I have enjoyed the seminar a great deal and have learned much from it. My most valuable finding has been that astronomy is not the career I want to pursue. (S)
>
> The seminar has not differed from my expectations, so much as philosophy has. The great virtue (or drawback) of a seminar is that it places you on intimate terms with its subject matter; so that you soon find out whether or not your love of the field is genuine. I have discovered (not too late) that philosophy is not what I thought it was. For that discovery alone, the seminar has been very valuable for me -- albeit somewhat disappointing. (S)
>
> Rather than being narrow, the seminar has touched on so many and varied subjects that I no longer know what occupation I'm interested in, or what field of concentration. The seminar has introduced many new ideas and unfortunately has completely destroyed many of my preconceived ideas. (S)
>
> I applied for a seminar because I was interested in coming into close contact with scientists to see how they lived, thought, and spent their time. I am now one of Dean von Stade's "scientists in high school who has since changed his mind." (S)
>
> The seminar has succeeded in moving me from a point where I thought I knew what I wanted to do -- medicine -- to a point where now I don't have the slightest idea. It has both broadened and changed many of my views -- to the point where

> although once my interest was mainly in science, it is now swinging to some bridge between science and the humanities, if such a bridge exists. (S)
>
> I was toying with the idea of science as a career, and I wanted to see a body of professional scientists at work -- from the bottom to the top. I did, to my satisfaction, and am now happily out of science. (S)

We have no way of discovering whether among these students there were some whose disillusionment was unnecessary or premature. But our data on academic performance (page 36), and on subsequent satisfaction with choice of field (below), suggest that this early opportunity for disillusionment was in most cases beneficial.

In the frequency and chronology of their changes of area, seminar graduates have seemed quite similar to the control group:

		net change between admission & Oct. of soph. year	net change between Oct. of soph year & present
Inclined, at admission, toward natural science			
	SEM	-10.5%	-.2
	CON	-10.8	-1.2
Inclined, at admission, toward social science			
	SEM	+9.5	-1.0
	CON	+10.4	+ .7
Inclined, at admission, toward humanities			
	SEM	+1.0	- .8
	CON	+ .3	+ .6
gross change			
	SEM	21.0%	2.0
	CON	21.5	2.5

Last fall, however, when both groups were asked "Are you happy about your decision as to field of concentration? If not, to what field would you be most inclined to shift?," 18.2% more of the control group than of the seminar students reported significant dissatisfaction with their field, and 29.3% more in the control group wished they were in a different area. The seminars, in other words, did not inhibit exploration and appear in fact to have contributed to its effectiveness.

With regard to specialization and choice of field, there are evidently some significant differences between areas: 58.3% of the graduates of science seminars cite their seminar experience as having first or second importance[1] in their decision as to choice of field. In the social sciences: 53.6%; in the humanities: 34.9%. A pattern of response emerges here that recurs consistently in other data:

a. Of the three major areas, the humanities seem in general the most accurately understood by incoming freshmen. This is not to say that the concerns of the English Department, or of Philosophy or Fine Arts, are old hat or accurately anticipated -- simply that compared with the other two areas the humanities seem more intelligible. Students concentrating in the humanities

1) more frequently than others cite pre-college experience as the principal basis of their choice;
2) if they enroll in a freshman seminar in the humanities define its impact in terms more often of orderly "illumination" than of "discovery" or "disillusion;"
3) far less frequently than other students decide to change to another area (and conversely students in other areas relatively infrequently shift into the humanities).

b. The social sciences, being in general (excepting history) the least represented in the schools, tend to strike freshmen as relatively strange, and often, relatively intriguing. Thus

1) many who come with no strong predispositions undertake quite quickly through a seminar or otherwise, to get a look at the area;
2) subsequent concentrators in the area more frequently than in the humanities cite a seminar or other curricular experience in college as determining their choice of field;
3) if freshmen enroll in a seminar in the social sciences they define its impact in terms more often of "discovery" or "explosion" than of "illumination" or "disillusion;"
4) they slightly more often than students in the humanities (and far less often than students in the sciences) change to another area (conversely students in other areas, particularly the sciences, shift frequently into social science).

c. The natural sciences, being extensively represented in the schools (often by the only male role model in the building), as well as regularly popularized and dramatized by the press, seem to many incoming freshmen both intelligible and alluring. But because in most schools they have until recently been superficially represented, while at the same time the other areas were represented unalluringly, freshmen have often come with an ill-founded estimate both of their own "promise" and of the relative appeal of the area. Thus

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[1] among non-academic and pre-college, as well as college, experiences

1) many students undertake with great rapidity, both because of their own convictions and because of the curricular pressure in the sciences, a determined scientific program;
2) they more frequently than in the social sciences cite pre-college experience as determining their initial choice of area, but also frequently change areas, citing as cause college experience;
3) if they enroll in a freshman seminar in the natural sciences they define its impact relatively more often in terms of "disillusion" or "discovery" than of "orderly illumination;"
4) far more frequently than other students, they decide to change to another area - most frequently, as would be predicted, to the social sciences.

Thus although we conclude that the seminars have somewhat expedited considerate choice of field, it is not possible to describe in universal terms the nature of their impact.

Finally, it needs noting that choice of field, for many Harvard freshmen, seems inextricably joined with choice of career. To tell them not to worry, as freshmen, about that choice is like telling them not to worry about grades. The seminars have found a cheap solution to the grade problem; concern with careers they have not been able to evade. Nor, in most cases, have they tried to confront that concern directly. Indirectly, however, and with inevitable relation to choice of field, they appear to have had some effect. What effect is not entirely clear. The data may mean either that the seminar graduates have made wiser decisions in the course of the freshman year or that they have been content to delay longer their final reassessment:

	changed career plans	
	between admission & Oct. of soph. year	between Oct. of soph. year & the present
seminar	9.6%	5.9
control	9.6	9.5

The data seem also to suggest, incidentally, that the seminars, perhaps by example, have affected students' views of teaching and scholarship as a career: Among the seminar group, between the beginning of the freshman year and October of the sophomore year, there was a 5.5% loss of prospective teachers and scholars; the control group lost 12.4%.

I seriously considered, for the first time, college teaching. (S)

> Partly because of it I have confirmed my decision to concentrate in English, and I now hope to teach at the college level. (S)
>
> I thought I wanted to teach before I got into the seminar. Now I know I want to. (S)
>
> My field of concentration is no more definite, but as a result of the seminar I am considering an academic career. (S)

postscript

Perhaps because the students have generally been stimulated by this experience, so, quite often, have the faculty.

> Although many of the students in our group had no background in the field of the seminar, they brought to it freshness and raised many of the old fundamental questions again. (F)
>
> Freshmen respond to being taught, as upperclassmen often do not respond. At the end of almost every meeting of the seminar this year I found myself both thoroughly exhausted and thoroughly satisfied. (F)
>
> This program is making it possible for the faculty to keep up with the evolution of the freshmen, and to adjust his thinking and teaching to a new and rapidly developing situation. (F)
>
> For me personally it has been quite a useful experience. Having taught theological students for some time, I have of course been tempted to overlook some basic questions related to the Biblical material, questions which some of the freshmen raised with clarity and even with forceful imagination. What more can a teacher hope for? (F)

One student, at least, was glad to have been able to offer the faculty this productive educational experience:

> I believe that the faculty who took part in the seminar program learned as much, if not more, than the students. I doubt whether their valuable time could be spent in a better learning situation. (S)

the seminars and academic performance

The members of the control group examined in this report were matched with the graduates of the freshman seminars partly on the basis of Predicted Rank List (for Radcliffe on the basis of scores on the College Board's verbal aptitude test). Within each class that match was almost absolute:

PRL

	1.0-1.9	2.0-2.9	3.0-3.9	4.0-4.9
seminar	2.0%	44.8	45.7	7.5
control	1.4	46.1	44.6	7.9

The academic performance of the two groups was studied not because we felt that the seminars should be judged at all directly in these terms but simply to be sure that the graduates of the seminars were not in these terms doing significantly badly. We have examined two indices of academic performance: percentile rank in class (because it is more discriminating than the Rank List) and, where applicable, the student's latest tutorial grade (because we felt that performance in tutorial might more accurately than anything else reflect the kinds of qualities the seminars were concerned with).

		90-99	70-89	50-69	30-49	10-29	0-9
June '62 percentile[1]	SEM	16.6%	25.1	20.2	19.8	14.1	4.2
	CON	11.4	24.0	21.0	20.3	14.5	8.8

		A,A-	B+,B	B-,C+	C or lower
latest tutorial grade	SEM	45.7%	36.4	11.0	6.9
	CON	35.1	39.3	14.1	11.5

> I want everything to stop. I want to be able to reject everything that worked from the beginning. Really I want security. I am not secure in society's values. I want some logical and clear values and purposes of my own that I can hold to and turn to. But nothing will stop, everything goes on. I try to reject everything; even while I'm rejecting I'm forced to take in things. My mind is a muddle. I have to learn things when I don't want to learn, and consequently I can't learn them very well. If I could organize myself first, I could learn these things better, and I could fit them into a place. Before, they didn't bother me because then I had an order. This order came from society. Part of it came from my parents. It was not mine though. It was something given to me,

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[1] Harvard only -- Radcliffe does not compute percentiles

> something definite, and so learning was easy because it fit in. Now I can't use this order anymore. I've outgrown it. I must have my own order. But I'm like a little boy who has only one pair of pants. What does he do when they get a big rip and have to be mended? He can't just stop living and doing while they are fixed. (S)

We have examined also withdrawals from college.

Of the Harvard seminar graduates studied in this report, 93, or 16.1%, have left college. Of the control group, 58, or 10.3%. (And the rate of return, though slightly higher in the seminar group, leaves that group still with a significant deficit.)

This difference may reflect a habit of venturesomeness more characteristic of students who apply to seminars than of others. It may also reflect the seminars demand for self-knowledge and the fact that such knowledge is not by all students best gained in an academic setting. Whatever the explanation, it is reassuring to note the circumstances of these withdrawals.

	with prejudice[1]	without prejudice
seminar (Harvard)	28.0%	72.0
control (Harvard)	51.7	48.3

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[1] including not only those students who were asked to leave but those also who left voluntarily with unsatisfactory records

III. THE SEMINAR METHOD

1. INQUIRY IN DEPTH

depth, and "realness"

> We have, moreover, in schools and colleges alike, often made the mistake of believing that comprehensive coverage is the inevitable method. Surveys have their place, and it is an important one, but the systematic or comprehensive survey is often better calculated to stifle the student's interest than to arouse his curiosity and to lead him to go on for himself. (from General Education in a Free Society)

It was a thesis of the seminars that by attacking vital problems, inevitably in depth, we might not only arouse curiosity but provide valuable insight into the significance and materials and methods of an area. Depth seemed critically important, for without it neither insight nor curiosity could be expected. And realness, by which we meant "things that evidently matter, looked at in the instance," seemed for the same reason similarly important. We did not worry that by pursuing a focused inquiry we would lose sight of breadth or method -- we hoped, rather, that in the pursuit the student would discover breadth and method, and that because he had discovered them they might have powerful and lasting meaning.

> Instead of [in fine arts] reading a prosaic analysis of exuberant vitality, we may get a direct vision of it in Manet's portrait of the boy with the flute. We may study human nature in the psychologist's abstract accounts of it or we may see it in the vivid presentations of . . . individuals. (GE)

Our college curricula have generally been built around an orderly progression of diminishing surveys. That arrangement is useful, and makes instruction manageable, but it neglects the fact that intellectual progress is not, in real life, made in this way. More often it begins in rather immediate and focused questions and proceeds to other issues and to abstractions. The pyramid is a valid instructional device; it does not, however, represent the nature of scholarship accurately or appealingly. Because the seminars intended to make that representation they have asked of content depth and realness, hoping thus to provide students, in their approach to the pyramid, perspective, interest and understanding.

But the seminars have not been satisfied, indiscriminately, with depth. They have looked increasingly, also, for centrifugalness. There is something of this quality in almost every intellectual inquiry -- it begins in a small radius and as it accelerates encompasses an ever-expanding field, limited only by the reach of the inquirer. But this quality is more present in some inquiries than in others, and being concerned with breadth as well as with depth the seminars have sought, quite consciously, centrifugalness. They have found it in strange places: in the village life of Mexico and in Boston's North End, in Mayan glyphs and in a painting by Manet, in the American Constitution and in the workings of the Supreme Court, in elementary particles and in a play by Chekhov, in the Salem witch trials, and in the behavior of insects and of a bright red bacterium called Serratia marcescens.

Not all of the seminars have begun with readily defined questions -- some, more blatantly directed toward breadth, have asked instead "what do we mean by 'liberty?'" "how do people make judgments?" "what has westernization meant in India?" "what is the place of science in society?" "what is the nature of the relationship between culture and the individual?" "what has philosophy to say about history?" These seminars gave prefatory definition to the area of their concern by an almost cosmic question (which evidently mattered). But they invariably went from there to inquiries with sharp focus and thence, centrifugally, to discover the meaning of the question.

In General Education in a Free Society it is said that "to analyze is inevitably to separate what in fact clings together." The seminars have said that to truly analyze is inevitably to discover what clings together. That such discovery has been occasioned by the seminars is evidenced by the reports cited earlier, in chapter II, on the impact of the seminars on choice of fields. It is also evident in students' reports on the effectiveness of the "centrifugal" seminar as "general education:"

> Having divided the first 3 years' seminars into four categories (narrow and not very representative of the general field; narrow but representative of the general field; "centrifugal;" "blatantly" broad), we asked the graduates of each to rank their various curricular experiences in the order of their effectiveness in

accomplishing the aims of general education as defined by General Education in a Free Society.[1]

	ranked 1st or 2nd	ranked 3d-8th or not mentioned
a freshman seminar (as rated by graduates of "narrow and not very representative" seminars)	17.4%	82.6
a freshman seminar (as rated by graduates of seminars that were "narrow but representative of the general field")	34.1	65.9
a fr[illegible] seminar (as rated by gr[illegible] "centrifugal" sem[illegible]	56.9	43.1
a fre[illegible] as rated by graduat[illegible] broad" seminars	51.7	48.3
most effecti[illegible]r-level GE course [included here for comparison]	38.9	61.1

The "centrifugal" inquiry seems peculiarly well suited to the aims and methods of the seminars.

Flexibility has been an inevitable and useful consequence of the "inquiry in depth." In a course of lectures it is possible for the teacher to adhere precisely to his outline and for the students to know exactly where the course is going by consulting the reading list and schedule. But in an inquiry of the sort many seminars have undertaken, as in any genuine inquiry, it may not be possible to adhere unwaveringly to a program. Unforeseen variables and previously accepted theorems may require to be dealt with.

> Recently one of the students embroiled us in a discussion of utopian ideas in general and B. F. Skinner's work in particular. After a turbulent meeting in which many points were outlined and argued we decided to invite Professor Skinner to join us in discussing Walden II. Everyone read the book and the evening was as provocative as a fox in a barnyard. (F)

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[1] to develop students' ability "to think effectively, to communicate thought, to make relevant judgments, to discriminate among values"

Where flexibility has been wisely controlled it has been a valuable feature of the seminars.

Finally, as observed in General Education in a Free Society, "It is not the power to distinguish or state the universal formula, for separated contemplation, which heightens our skill. It is the power to use the formula in the new concrete situations as they fleet past us which education aims to advance." That power, we take it, is what is meant, in the language of academic disciplines, by "method." And to a real understanding of method, experience of inquiry is important. The seminars seem frequently, by realness and depth of inquiry, to have generated such understanding.

> Perhaps I need another course in philosophy to relate the methods I learned in the seminar to the problems around me, or perhaps I need more patience than I possess. The seminar was instructive and at times very exciting, and although I did not make the relation that was needed [between the seminar and my personal pre-occupations], it gave me the materials for making it. That is, I think, a considerable achievement. (S)

entanglement

As important as inquiry in depth, and dependent upon it, has been entanglement of the student in learning.

The seminars have supposed not only "that the sooner the student sees himself as a part of what he studies the sooner he will be in a position to enjoy what he studies" but that the sooner he sees himself as a part of what he studies the sooner he will be in a position to learn. By the way it is taught, a subject that is to be learned in a more than schoolboy way must if possible be given a context that has some meaning to the student. By providing pre-abstracted structure, and by providing answers, we may not much engage the student.

> But, you ask, are not all these studies in history, philosophy, and science more than cultural acquisitions? When our pupils learn that somebody thought such and such and then was proved wrong by somebody else, is that not teaching our pupils to think? -- or when we attempt to demonstrate that history shows that there are many sides to a question -- or that the argument is resolved by an Hegelian synthesis (or that it is not) -- and when we show the evolution of modern physics from Newtonian physics -- are we not in all this teaching our pupils to think creatively? I am urging that we not be embarrassed by having

> to say "Well, no, not really." Just as we are not teaching them to play the piano, or to paint, or to dance, or to love, or to cook, so we are not teaching them the highest of the arts -- how to use the individual mind in a creative way for the special problems before that mind. (Edwin H. Land, Commencement address, Stanford University, 1962)
>
> The great bane of science and social studies is mechanical repetition of uncomprehended words and phrases. (GE)
>
> The trouble with the usual academic approach is that it makes knowledge something out there. (S)
>
> . . . schools have, after all, a huge task of plain exposition to perform if students are to have in their hands the main tools and elements of knowledge, and, instead of repeating this work, colleges should move on to new relationships and new stages of understanding. (GE)
>
> It is right to let a student know roughly where he is going, but wrong to save him the journey. Too many courses tell him throughout what he is seeing, so that he memorizes the account of a trip which he never took. His head was buried in the guidebook. (GE)
>
> Education must be so contrived that the young, during the very process of their schooling, will realize the difference between abstraction and facts and will learn to make the transition from thought to action. . . .There is not one best way of introducing people to Homer or Plato or Dante. Or, if there is, which it is is not known. Freedom for the instructor is essential. He only teaches, in this field, by letting his students watch the play of a mind with a mind, that their minds may play in turn. (GE)

The seminars have shared this concern with the difference between abstraction and fact and with the transition from thought to action. But they have disagreed, fundamentally, with the Red Book's optimism about the consequences of "letting students watch."

The chairman of the chemistry department of another college was considering with great interest Harvard's freshman seminars. "You know," he said,

> when I was in graduate school in Pennsylvania we didn't have much money. And so, often on Saturdays we'd pile the kids in the car and drive to a nearby Quaker village where people rode unicycles as a kind of community hobby. We'd entertain ourselves for the afternoon by just sitting around on the green watching the townspeople ride their unicycles. Almost regularly each week we'd do the same thing. Do you know that to this day I can't ride a unicycle?

Elsewhere the Red Book comments on the course it has proposed for the social sciences ("Western Thought and Institutions"): "We believe that the course . . . will offer the student, even though he may fail to grasp the significance of much of the material at the time, a set of intellectual tools which will be of the greatest value to him." It has been a further conviction of the seminars that although the student may *never* grasp the *whole* significance of what he studies if he is to make it at all his own it must be presented in such a manner *that he may discover some* of its significance. Entanglement, again has seemed critically important.

If the freshman courses have too often been seen as "a kind of purgatory through which the student must pass before he comes to the Elysian field of a 'major,'" the reason may be that in the freshman year he is too much *subjected* to learning. Hence the seminars' attemp , by means especially of 'entanglement,' "to undercut the schoolboy notion that learning is a thing divorced from being yourself."

> My strategy in the seminar was to engage their interest immediately by bringing them to the North End and allowing them to see from the perspective of the anthropological or sociological field worker what they might have missed as tourists or even residents. I wanted them to try to perceive the character of this community with their own eyes and ears and noses. Since they would be working with their own observations from the start, it would then be easier to bring them to historical and sociological materials for they in turn can then bring to such materials the authority of their own experience. (F)

The evidence is that the attempt has been successful:

> It was the seminar which led me to understand that intellectual work, demanding work, is also satisfying and enjoyable. And I think -- perhaps because fiction writing is a highly internalized business oriented towards the author's own standards as much as anyone else's -- that it brought me to an understanding of the personal nature of education. The active side of education, if you will. In high school, everything was easy. You went to class, were told all the facts, neatly summarized and organized. You listened, remembered, and spilled it all back. In a very real way, you did not educate yourself; you were educated. It was an almost completely passive process. This is not a very good state of affairs. But most important, it is not a very interesting state of affairs. What should be a most exciting part of your life becomes the least interesting. . . .How did the seminar accomplish all it did? I would say just by getting me interested in something. It was as simple as that. (S)
>
> We had thought 39° was pretty cool, enough to deter the freshmen from even getting their feet wet, and my assistant and I were prepared to raise all the live specimens for them out of the depths. But we misjudged the caliber of our students; I don't know, young people just don't seem to be the same as they were in my young days; these freshmen actually want to get bodily into the ocean along with their teachers, equipped with neoprene suits, face masks and snorkels, and pick up their own specimens from the bottom. So we have been taking them in with us two by two, equipped with our own second and sacred outfits, and they have certainly profited by the experience; after all, there is a great difference between finding and observing your own specimens *in situ* and having them handed out to you by your instructor on a plate -- collapsed, cold, and clammy. (F)

> I consider this seminar to have been by far the most rewarding of all my courses thus far at Harvard, due not only to the specific knowledge I have acquired, but -- more importantly -- to the way in which I have gained it. (S)
>
> Another major effect of the seminar stemmed from the work on Professor ______'s book. It led me to read at least one book in a way that was completely new to me. It was necessary for me to read with the thought in mind that "this may be wrong!" "It may not even be what the author wants to say!" "This concept is over-stated!" "This concept is not given enough emphasis for its importance!" In addition to being introduced to a new style of reading, I was introduced to a new realm of thinking. I began to discover how a book is written. (S)
>
> First, on any topic, I read the basic work or works describing the general aspects of the topic; these are works comparable to those read in the ordinary gen ed course. However, aside from giving a broad background, these books are essentially useless; in writing my papers, I almost never make reference to them. The real reading is in specific books on particular aspects of the topic. Not only do I get more specific facts and more helpful information from this reading, but I also get to form my own opinion on a given subject, since much of the reading is in primary sources. I don't have to swallow somebody's predigested account of what happened. Very often I come out with the same interpretation that the secondary authors have, but I understand the topic and the interpretation far better because I have done the research myself and have pieced together the argument bit by bit. (S)

As a method for the whole four years of college "piecing together" may be uneconomical -- but at least as a form of introduction to those years it seems a powerful and important economy.

ambiguity; 'orthogonalism"

> A historical fact is not merely a fact; it is a victory or a defeat, an indication of progress or retrogression, it is a misfortune or good fortune. (from *General Education in a Free Society*)
>
> Now I urge that once a group of people has taken one side or the other in a controversial situation, then the mind, except as a political tool, is no longer used creatively. Indeed, I will go so far as to say that seeing both sides of an argument, or even admitting that all is not black or white, that there are grays in between, is an utterly inadequate approach to most established controversies. The mind ceases to be a creative tool and becomes a social instrument for fun and excitement and joining one's friends and opposing one's enemies. Most controversies might be said to exist along an axis, like the abscissa in a rectangular coordinate system, and all the arguments, discussions and compromises go on along that axis, never to be resolved. And then . . . some great tide of history, the change in the nature of trade in Venice, invasion from the North by the Huns, some great tide of history alters the whole situation and the controversy is resolved, not along the axis, but by a group of phenomena all of which depart from the original structure of the controversy. Is there a way in which we as individuals can do what history does? Can we as individuals deliberately act at right angles to the axis

> of controversy? -- act, in mathematical terms, orthogonally? Mathematically, what that means is that anything you do on the orthogonal axis, the axis at right angles to the axis of controversy, has no projected effect on the axis of controversy. You are not involved with either side. You find a way of solving the problem without having the luxurious emotional privilege of being at one end, loving your associates, and hating the people at the other end. As you go on to your orthogonal solution of the problem, your special way of solving it that does not involve the axis, you find yourself a lonely person. It is hard to say what is worse, not to have friends or not to have enemies; as an orthogonalist, you have neither. (Land, op.cit.)
>
> Its principal educational value is its ability to acquaint us with the genuine scholarly feeling of being at a loss at times. (S)

It is a consequence of recent history -- in international affairs, in literature, in philosophy and religion and in the organization of society -- that young people do not today look, in each historical fact, for victory or defeat, progress or retrogression, misfortune or good fortune. They neither expect, nor even, any longer, yearn, for those kinds of neat, reassuring polarity. And yet they are seldom content, either, with "merely facts." They are eager to believe -- and do believe -- that there are more valid ways than either of these of seeing and responding to their world. They are pragmatic, but with a faith in the power of pragmatism not only or always to "compromise" but to be sensitively and profoundly creative.

Though they distrust, in themselves, cheap insight and easy answers, they are neither so foolhardy nor so vain as to think they can discover all answers for themselves. Having achieved a personal sense of how approximations of truth are arrived at they are willing, if they see in their teacher that process reflected in a way they can respect, to take a great deal of teaching on faith. But without that insight, or without that respect, they may gain little of lasting value from instruction. Inquiry in depth has seemed an appropriate and effective means of providing freshmen opportunity to gain such insight.

"exploration," "mediation," and "commitment"

The Red Book, in its approach to education as in its approach to historical fact, most essentially in its concern for "the perpetuation of common beliefs" about "the good," seems somehow strangely out of place in the Harvard climate.

> Why is it that so many Harvard students I know (not all by any means) recognize a schism between the academic world and life or in some cases, what is worse, between the academic and the intellectual worlds? Perhaps Harvard shouldn't have anything to do with its students' values, but it should, I think, let them develop in a freer way. We read a book in an English course and talk about it from the standpoint of criticism, and in a Soc. Rel. course we talk about it in relation to certain models, and in a history course we speculate about the influence somebody has on something, but when do we talk about what it means? Of course these issues a student must finally decide for himself, but I don't see why American education has to talk around what is most on many people's minds. (S)
>
> I would say that I have become less idealistic. Harvard certainly does tend to destroy ideals. . . .(S)
>
> The college student is often typified as a critic and rarely as an innovator or active defender of ideas. Having no firm convictions of his own, he can criticize anything with skill, including all sides of the question. (S)
>
> This [prevalent] intellectual attitude of mind presupposes that the individual will utilize analytic reasoning, restraint and skepticism (attributes of mind which contribute to a method of attack, but which to the student often become confused and intermingled with content itself so that knowledge seems to present itself as doubtful -- one cannot trust, one dare not trust, one's conclusions or one's creative impulse; there is no article of faith but this very faithlessness to any bit of material to which one might "mistakenly" have felt a commitment). (F)
>
> I have always felt that the main fault of the college is that as an institution it has a certain coldness which is sometimes good, sometimes promotes the kind of tough-minded objectivity which is encouraged here, but it sometimes closes more doors than it opens. I think the thing is that everyone would like to be creative, but I don't think there are many who have the capacity to be really creative. Criticism sort of becomes a substitute, and I don't think it is a good substitute. (S)
>
> If Harvard has a creed, it's a creed of inquisitiveness and questioning. . . .(S)
>
> I viewed Harvard as hostile. I was unsure of trying to cope with sophisticates. At a small school, say Swarthmore, I don't think there would have been the problem of intellectual pseudo-sophisticates. Beats, eggheads, and the like -- yes, but not pretentious intellectuals. Intellectualism is something to be desired. But I intensely dislike the cocky air of many dinner table conversations. (S)
>
> [The seminar provided for a] greater and more democratic opening of students to one another than we believe ordinarily would have occurred without the seminar. Superficial tolerance -- part of the Harvard ethos -- was replaced by genuine knowledge of radically different perspectives. The groups learned something which many people never learn: that it is possible to have strenuous polemic and even bitter argument without a necessary loss of understanding and even companionship. . . .For many, indeed, it was a discovery that one could be heated rather than blase, involved rather than distant, hostile rather than cool -- and it was a discovery also that faculty members could become heated and even explosive, that they could be wounded by criticism, and that they have feelings as well as intellects. (F)

The scholarly, intellectual enterprise of the university is to the undergraduate monumentally impressive. Because of the personal climate of the institution, and because of the organization within it of teaching, of the curriculum and of space, that intellectual enterprise is often, as far as his personal life is concerned, also extremely remote. The frequent consequence of this combination of facts is that the university, and the curriculum within it, comes to serve, in many aspects of the student's life, as mediator:

Because he is not very personally entangled in the university's intellectual life he can -- sometimes must -- remain detached. And yet, partly because it is remote, that life is so valued and impressive that he will not discount it. The result, facilitated by his increasing articulateness, is that the university comes to serve as "front" or "mediator" in his dealings with intellectual issues (and too often also in his personal relationships). And the evidence -- as inescapable in conversation at the close of a movie at the Brattle as in discussion carried on in some sections of Harvard courses -- is that the front may become, eventually, a wall. Intellectualism becomes a detour by which the student may escape direct confrontation. Commitment, which pre-supposes involvement, becomes difficult, even unattractive, and facileness and "exploration" takes its place. Often this adaptation occurs very smoothly and creates no problems, because facileness and exploration are both approved. But when facileness is used as protection, and exploration is shallow and a surrogate for commitment, four years in Harvard College may be largely wasted.

The entangling inquiry in depth, requiring direct confrontation of questions representative of the concerns of the scholarly community but carried on in a setting that is intellectually and personally supportive, can evidently lead to an engagement in the university that makes detachment thereafter uncomfortable. It may also make more viable both exploration and commitment.

2. ENVIRONMENT

'The chief and characteristic mistake which the teachers and governors of our colleges have made in these latter days has been that they have devoted themselves and their plans too exclusively to the business, the very commonplace business, of instruction, to well-conceived lectures and to approved classroom method, and have not enough regarded the life of the mind. The mind does not live by instruction. It is no prolix gut to be stuffed. . . .The object of a liberal training is not learning, but discipline and the enlightenment of the mind. . . .The undergraduate should have scholars for teachers. They should hold his attention steadily upon great tested bodies of knowledge, and should insist that he make himself acquainted with them, if only for the nonce. But they will give him nothing he is likely to carry with him through life if they stop with formal instruction, however thorough or exacting they may make it. . . .Their teaching will follow him through life only if they reveal to him the meaning, the significance, the essential validity of what they are about, the motives which prompt it, the processes which verify it. They will rule him, not by what they know and inform him of, but by the spirit of the things they expound. . . .My plea, then, is this: that we now deliberately set ourselves to make a home for the spirit of learning: that we reorganize our colleges on the lines of this simple conception, that a college is not only a body of studies but a mode of association. . . .(Woodrow Wilson, Address to the Harvard Chapter of Phi Beta Kappa, July 1, 1909)

. . .We assert that the best way to infect the student with the zest for intellectual integrity is to put him near a teacher who is himself selflessly devoted to the truth. . . .(General Education in a Free Society)

While independence is encouraged at Harvard, the independence gained is empty. It has no active effect on the world. One can cut classes, arrange and rearrange his schedule, act and dress as one pleases, without in the least affecting anybody's life. While a first reaction to the fact that "no one but myself will suffer if my paper is handed in late" is one of meaningful responsibility, an individual's more lasting reaction may be "How meaningless my task is, if this is the complete scope of its effect." Supervised thinking for competitive grades does not seem an authentically intellectual pursuit, nor does independent thinking that is not communicated to others, that has no kind of influence in the world. (S)

I hesitated to ask questions after lectures or section meetings partly because I was afraid of taking up too much of someone's time. An atmosphere of individualism and self-reliance can be intimidating. (S)

Education involves, ideally, an alternating rhythm of idolatry and subversion, the authority principle and insurgency. The lecturer ravishes his audience intellectually. But the student must have the opportunity for defiance and counter-attack. And a graduate assistant, often little removed from a bright undergraduate, does not provide an appropriate object of attack. It is this question-asking, idol-smashing phase that is the key to real learning. The other -- quiescence in the lecture hall -- is often mere busy-work. (David Boroff, ?)

A lecturer can be stimulating, but rarely motivating. Motivating force operates on a more personal level which really doesn't exist between faculty and students at Harvard. (S)

Harvard is a huge school, and although I have not minded having hundreds of other students in my courses, and although professors will help you if you ask them, it is easy to begin to feel that each course is a machine. Enthusiasm dies. In a seminar, enthusiasm for all of education is reborn. (S)

> I found that students came talking from sentence to sentence (and being exposed to courses where they thought they were encouraged to do this increasingly) without ever touching ground. I tried to get them to realize that what they thought and felt and experienced was authentic and to be respected, so as to get them to the point of recognizing their own thought before censuring out because Professor X had said it so much better. For this, I needed to get them to respect each other, not only so that they should be free to express their thinking without fear of being ridiculed or despised but so that they could be free to think, encouraged by the fact that the group waited to hear what they had to say. (F)
>
> For practically the very first time in my education, I could speak or not speak, as I wished, without feeling anxious; for no judgment was being made of me. I could admit ignorance or bewilderment without feeling anxious, for no one was judging me. As much as possible, considering our long experience with the competitiveness of American education, the atmosphere was, how shall I say, peaceful; though we often fundamentally disagreed, it was genuine disagreement, not attack for the favor of a teacher. Nearly all of my experience in schools has been in classrooms where I was competing with other students for the right answer, and where the right answer made you a good boy. So often one said things one didn't really believe or understand, just to please; and often one criticized to gain superiority. Well, in Dr. __________'s seminar, it wasn't at all like that. (S)

As important to the seminars as the nature of their substance has been the nature of their environment. And here the seminar leader has had first importance.

The role of the good teacher in the freshman seminars has been not only to transmit knowledge but to provide personal demonstration of the nature of scholarship and to create a setting in which students might discover how to learn for themselves and from each other. There is nothing novel about that role. The freshman seminars did not invent it. They were designed to exploit it, and the results were predictable:

> I have had the experience of direct conversation with a very educated person. I don't know how to explain it, but you get some sort of feeling about what it means to be educated, about why you're going to all this bother, and a respect for the educated mind and some insight into how it got that way. (S)

This is not, in whatever area, an easy role. It demands a mobile command of a wide area of inquiry, infectious interest in that area and extraordinary interest in teaching, hard work and patience and flexibility, and the ability to sustain a constantly-threatened balance between direction and non-direction. It may be as many different roles as there are students in the seminar. And it requires, while making almost impossible, a fundamental consistency of approach that in teaching of a less direct and personal kind may often be far less important. The closeness of the seminar leader may tempt the students to ask of the teacher answers they should be discovering for themselves. And the seminar leader may find that in the attempt to be both teacher and colleague he has come across effectively as neither. (But because the seminar form is extraordinarily adaptable the seminar leader has at least the advantage of being able to teach in the way that suits best his temperament and his convictions about teaching.)

> I found that I was ambivalent about wielding and yielding power. I told myself that it would be good if the students questioned my ideas, but when it first happened it was unsettling. I took my turn making a presentation of my research, and the students joined in freely and at a high level. I had no better chance of having my say than anyone else, and I was just as likely to be interrupted. At times I could hardly get a word in edgewise. I did not always win my argument. It hurt to be interrupted. I came home after some meetings frustrated that I had not been allowed to offer all the wisdom I was prepared to dispense. . . . In retrospect those meetings in which I let them take over were the most spontaneous and most productive of all, and full of good sense in their debates. (F)

> I might mention that Professor _________'s seminar is more formal than some others: no coffee, loud laughter, dinners, etc. But to a certain extent I like it this way. We are working on an intellectual problem, and I feel no more stimulated over dinner than in our quarters. And although we can't claim to have sipped coffee with Professor __________and there has seldom been boisterous laughter from our room, the atmosphere of the meetings is excellent. (S)

> One pitfall in this enterprise is that we may not follow through after we declare our principles. It is easy to produce a washed-out version of the seminar, lazily unsheathing our own wisdom and authority, planning the readings and projects for the students and generally laying out the structure and substance of the year for them. If we suspect that they can't do it for themselves, we can readily turn the suspicion into a self-fulfilling prophecy. (F)

> The members saw me sometimes as a leader, sometimes as an equal, and I managed to suffer both ways. (F)

> There is no apparent hand of authority, or guiding principle, yet we all are aware of its presence. Although the discussions are not structured ostensibly there still is an unseen force that guides them. (S)

There is an additional function of the seminar leader that warrants mention: Almost inevitably, whether he likes it or not, he becomes the freshmen's general adviser. There is ample evidence in the freshman seminars for the Red Book's statement that "the general advisory function is most effectively performed when it follows naturally and directly out of those relations which are a part of the educational procedure."

It is easier to describe the role of the seminar leader than it is to describe his impact. We can back with hard data only one conclusion: that the seminar experience has disproportionately increased the undergraduate's connection, or sense of connection, with faculty. We posed the following question to present upperclassmen in the seminar and control groups: "Given a reference form calling for personal and intellectual assessment, to how many members of the faculty could you give it with some confidence in the validity of their assessment?" The results were as follows:

	to 5 or more	3-4	1-2	to no one
seminar	25.4%	34.2	30.5	9.9
control	16.9	24.7	33.5	24.9

It may be worth noting also that the faculty, through the seminars, have come to know well and early a great many undergraduates. We went last fall to seminar leaders from the program's first year and inquired about individual students. Most recalled every student who had been in their seminar, and they knew in a great many cases what had happened to them since. Graduates of the seminars had continued informally as advisees or friends or as faculty-aides, they had appeared as juniors or seniors as tutees or for advice on a thesis, and in a dozen or more cases had periodically reassembled simply for reunions.

givenness

It is clear that many seminar leaders' most important impact has had to do with the interrelatedness of different kinds of learning, and with scholarship and education as "process."

> [The course-unit system,] because it encourages students to think of their studies as a series of blocks, each a unit complete in itself and separable from all others, . . . has a somewhat similar effect on the individual student also. That is, it divides his work into compartments, some of which may be related to others before or after, but many of which are simply islands of experience, connecting with nothing, leading to nothing. (GE)

A too-frequent side-effect of the lecture course is that it represents learning in discrete, neat units and as a completed process, or non-process. The student hears the lecture.

report on the results of inquiry -- he too rarely has opportunity to see behind the report and the outline on the blackboard to the difficult, continuing, often erratic adventure on which they are based. And his consequent tendency to see learning as a mechanical accumulation of givens is encouraged by final examinations and by the structure of the curriculum. "So many lectures on revolution in history yield an accredited understanding of revolutions, and so many additional courses of lectures produce, at their conclusion, a historian." We know that this is not so, and the student suspects it is not, but he too rarely has opportunity to discover what is so. The seminars, at their best, have given freshmen the opportunity to see a scholar engaged with them in the process of inquiry, and that process itself, rather than the classroom, has become the environment of learning.

> My seminar has taught that learning is not an end, an achievement, but a process of growth, a continuous experience, more a verb than a noun. (S)
>
> Dr. ________ has often corrected the text book's description of the straightforward method of discovery in science and shown us how these men succeeded only after trial and error, frustration and inspiration: this last point has given me much encouragement for my study of physics as a developing science. (S)
>
> The students had a sense that they were taking part in something that was being created rather than being beneficiaries of something already completed. (F)
>
> But there is a profounder aspect to my new understanding of conventional music theory and its faults. What I have come to realize is that for the modern composer there are no standing rules. Professor ________ never specifically related this fact to himself, but it was always involved. This was the most exciting thing about the seminar; to be in close contact with someone who was communicating to me the problems which he himself urgently faced in his own life. (S)
>
> A large part of my profit from the seminar came from my contact with a "great man." It came from hearing him talk about great men and seeing him perform the actions of a great man in such a way that he seemed human and great men seemed human. The humanization of great men had two effects on me. It made it more apparent that I could be a great man if I chose and that great men can be as wrong as anyone else. (S)
>
> . . .It is of marked educational value for them to be able to see their instructor's ideas changing and developing, not remaining fixed in a textbook-like framework. (F)

Many scholars assert that knowledge is for them a mistress. Far fewer acknowledge by their teaching "that it may suffer from being unsexed and becoming master." Like that which is wholly incomprehensible, what is complete and fully disclosed is sexless. It may be difficult to seduce freshmen by means of lectures.

It is difficult, in part, because seduction, to be efficient, must be tailored to the victim.

> Nowhere is the insight of a good teacher so indispensable as in holding students to their best and in setting for each work matched to both his gifts and his will. If to deal successfully with any of the differences so far noted calls for much experience and small enough classes so that teachers can know their pupils, that is supremely the case in this all important and entirely personal, unmechanical task of nurturing and judging character. (GE)

It has been an advantage of the seminars that because of their size and commitment to inquiry seduction, though still difficult, has seemed possible.

> It provided a setting in which a student who felt himself weak could try building on what he thought were strong points with an overall gain in confidence that could be generalized to other areas. (F)

And it is a further advantage that the nature of the seminars has made it possible not only for the teacher to seduce the students but for the students to seduce themselves, and each other. (It is largely because of that possibility that seminar leaders, where they have selected students, have tended to seek diversity of personality and background.) It is clear that such seduction has frequently occurred and has had impact beyond the confines of the seminar.

> In the ordinary section meeting, even of an advanced course, it is difficult to get students to listen seriously to each other rather than conduct spasmodic interchanges with the instructor, who is often in turn driven in desperation to that form of discussion that might be termed a lecturette. Sometimes a group will be dominated by two or three particularly vocal and assertive students, but even in a better balanced group there will almost invariably be one or more students who begin by not participating and who are hardened in that role as time goes on and as others increasingly gain a skill that the silent ones feel it is too late to try for. . . .In contrast, again and again, in our seminar, we were struck with the ability of the students both to protect and to facilitate the contributions of the shy and to reduce the pretensions, without destroying the egos, of the high and the mighty. (F)
>
> You get pretentious, you feel forced. I remember the first year you also felt so insecure that you had to demonstrate that you were something, you were someone here. Everyone trying to build their own personality to fight what they saw all around them. (S)
>
> The group developed a singular capacity for mutual acceptance and gentle correction. (F)

> There is respect at Radcliffe for the quick and expressive mind, but the ethos of privatism and individualism obstructs acculturation. (S)
>
> . . .the odd hours spent in the seminar room talking about the important things in life, the effects of Harvard and Radcliffe, religion, freshman year, love, ethics and morals, and what values are important, what is an intelligent person, what is wrong with the world and the human race, what qualities are admirable, etc. This learning from and talking with other people was carried somewhat over into the meetings, where we all discussed our opinions and learned from and taught one another. (S)
>
> The debate that thrived among us even away from the seminar table has to some extent shaped the intellectual side of subsequent friendships. (S)
>
> The interplay between five extremely different young people in terms of temperament and social background was vigorous. The social, intellectual and emotional education they gave each other was to me impressive. . . .I am more impressed with their interactions than with any teaching I may have attempted.(F)
>
> This is one of the few courses where I have learned anything from other students. (S)

3. VOLUNTARINESS AND UNGRADEDNESS

Voluntariness and ungradedness have multiplied every benefit the seminars have offered.

Voluntariness, in combination with the active role which the seminars assign participants, has led the student to feel that he has a personal stake in the quality of the seminar and a personal responsibility for it. He feels exhilarated when things go well, and guilty when things go badly, and in either case seems in consequence to profit more.

And the voluntariness of the seminars for faculty has been important -- both their voluntariness with respect to the offering of the seminars and their flexibility of form and content. The difficulties encountered by Yale's "Directed Studies" program and the fate of Columbia's course on "Contemporary Civilization" underscore what had been known without the seminars: that although the university is committed to repeated teaching of certain materials that teaching will be most effective if its form and coverage are not elaborately preordained and if faculty and students have brought themselves to it by initiative, interest and free will. The seminars have operated under the special advantage of commitment to no particular coverage.

> It is characteristic of the highly creative person that he is strongly motivated to achieve in situations in which independence in thought and action are called for, but much less inclined to strive for achievement in situations where conforming behavior is expected or required. (Donald W. MacKinnon, "What Makes a Person Creative?," Saturday Review, February 10, 1962)

> Why the hell does everyone always have to be concerned with being better than everyone else. Why does everyone have to feel that they have to earn "more" money, get "better" grades, drive a "better" car, live in a "bigger" house, give "more" to charity, drink "more", dress "better", play games and sports "better", know things that "other" people don't know, and generally try to be better, the best, rather than good? Why is the emphasis placed so much on competition? Can't people ever forget for just a minute trying to be bigger and better, and for that minute can't they be satisfied or not satisfied with themselves or something else, just because of the way it is, and not by the way it compares to something else? Why? Why does everything have to be rated and sorted and judged by some almighty standard? Why do my papers have to be marked, telling me that I did only so well in respect to this Great God Standard rather than talking about my paper, mentioning how it could be made more complete and comprehensible and perhaps mentioning some ideas, related to the subject, that I might like to consider? Why does Harvard have to be better than the University of Arkansas? Why can't there be Harvard and then there be the University of Arkansas? . . .Smaller and more classified, bigger and better; some [illegible] we're going to burst. (S)

> I have been reminded by these students' reactions that there is no educational experience outside of some context -- in this case, the experience of being students is in the context of a past and present in which discipline usually comes from outside. Given this context, being asked to take responsibility for one's own education inevitably creates tensions, guilt and a feeling of inadequacy. Ithink these feelings can be resolved in one of three general ways: first, by a somewhat dogmatic and "totalistic" affirmation of the ideology of freedom, which thus comes to replace the lost structure; secondly, by withdrawing back into the structured context of grades, quizzes, and assignments-due-or-else; thirdly, by simply facing and learning to live with the ambiguities and responsibilities of freedom. I have tried to encourage the last. (F)

Even more important than we had foreseen has been the fact that the students' work in the seminars has been in no way, at least officially, graded.

It has long been argued in defense of grades that they are after all only a symbol, and that if the student is genuinely concerned with learning his attitude toward his education will be unaffected by grades. But this defense underestimates the impact of symbols. Symbols give meaning, and the symbol which is a grade gives powerful meaning to an intricate matrix of motivations derived from teachers and classmates and family and community and from the American culture. It gives meaning to a set of motivations which have little to do with the student as an individual human being. It was our sense in creating the seminars ungraded that we might encourage students to come to terms with themselves, and then find in themselves or in the substance of the seminars motivation for learning. Experience has justified that expectation.

> Each written criticism is followed up by an interview. Since the students are given the feeling that the criticism is not a kind of ex post facto grade, but direction in how to improve their papers to a level far above that which would normally be expected of them, they respond very well. (F)
>
> Because I was learning and reading not out of fear of an examination, I experienced a sense of intellectual satisfaction I did not find in my lower-level courses -- or rarely found. (S)
>
> I felt I had to do at least an average amount of work to "earn my keep" in a "rent-free" course. (S)
>
> I felt guilty that I had to earn grades in my other courses to get into my chosen field and at the same time to do justice to the opportunity that the seminar had given me. I wanted at times to leave college and read, in order to gain background so as to gain more from the seminar. And I would spend most of a week on the seminar and ignore most of my regular courses; I would feel equally guilty because I had not learned to keep the seminar in perspective with the rest of my education. I just wasn't quite sure what Harvard wanted me to do with the seminar. (S)
>
> One of the most valuable aspects of this seminar for me has been in the effect it has had on my work in other courses. I has changed my whole attitude toward learning. . . .I work for myself and learning rather than working to please the report card. (S)
>
> Perhaps it is not strictly true that we were not judged, as I said; rather, we were judged in terms of ourselves, our capacities and potentialities. (S)
>
> Because someone there really cared how I was doing, whether I understood what was going on, whether I was improving, etc., I worked harder than I ever had before in my life. Consequently I learned more. And had the satisfaction of knowing that I came away with something valuable that I had truly earned. (S)
>
> The effect is to put much more responsibility on the student. I felt much more "duty bound" to do the work well for the seminar than for the other courses where the only consequence of slacking off was a lower grade. (S)

Recurrently students suggest that in fact in their seminars they were examined. They were examined every time the seminar met -- not just at mid-term and finals, they were examined by their peers as well as by the teacher, and they were examined in a way that seemed to many more rigorous and effective, while more personal and constructive, than any more formal examination. Furthermore this kind of examination tended to seem unusually real.

> One of the most demoralizing facets of the present freshman year is that the student is confronted with a kind of game, which might be called "Truth without Consequences," in which he writes but is then not held responsible for what he writes, need never explain, nor rewrite to take criticism into account. He is forever talking and writing into a vacuum, which makes the whole business seem inconsequential. (Christopher Jencks, 1959)

At its best the environment of the freshman seminar, of which ungradedness is an essential part, can provide what is rarely found in courses -- a creative environment for failure. Not only are students more willing to make mistakes; they are more willing to expose them. And in part because no one is grading, in part because criticism becomes a mutual process, both other students and the seminar leader feel freer to be incisive in their criticism. Just as every week the student is "examined," so he has opportunity for failure -- to fail in detail and along the way rather than monumentally on a final. They present an idea, see it misunderstood, and have immediate reason and chance to be more lucid. They undertake experiments that cannot work, not only those that have been tested, and they learn in consequence not only that they were wrong but; more important, something about experiments.

> Freshmen are bright and eager for adventure. Our call is to be responsive to their initiative and plans, even when these are transparently untenable. Let them fail early in the game. We may then help them interpret the experience so that they can try again more wisely. My group believed that it could do much better than the ill-fated Literary Digest poll of 1936, and they decided to survey voters in Newton just before the fluoridation referendum of last November. They were as wrong in their predictions as the poll they hoped to surpass. After recoiling from the shock, they have begun revising their artless notions about the problems of studying people. (F)

> Some people, although they will not come right out and say it, are coasting through the seminars, purely to avoid exams, papers, etc. . . .Unfortunately, even at Harvard, the students all too often take advantage of the freedom a seminar allows. Perhaps as high as one quarter to one third of the participants do not work nearly so hard as they should. (from the report of the Freshman Affairs Committee of the Harvard Council for Undergraduate Affairs)

> One of my roommates last year was enrolled in Dr. __________'s seminar and seemed to treat it like a weekly "Mr. Wizard" show. He did a total of about four hours work during the whole term in preparation and admitted to me that the only reason he took the seminar was so he would only have three finals to study for in June whereas the rest of us had four. He was, in my opinion, a perfect example of the "grade-grubber" class of Harvard students. (S)

> One member missed the point of the seminar, being scholastically immature to begin with, and avoided facing its opportunities by focusing on being permitted all the allowances anyone else received from me. I was unable to change that outlook, though I tried private consultations, encouragement, and referring the student to others in the University who might be of help. Next time I would try to establish ways of monitoring the members' activities, so that I might sooner identify and help those who postpone their day of reckoning with the demands of independent work.(F)

Although the seminars have not been graded, the seminar leaders have been encouraged to exclude students who persistently refuse to take their work seriously. To date only five students have been excluded or denied credit. Others probably ought to have been excluded.

It is our impression, however, that undergraduates are in general more afraid of their own sinfulness, and hence of freedom, than the faculty is for them. And that what is needed is not so much constraint as well-designed opportunity to learn to use freedom. The seminars, by and large, have provided such opportunity, and most students seem to have profited.

> The only objection that I can see is the possible time lost through irresponsible use of too much freedom. If the process matures the individual for a more profitable three remaining years, I do not think that the time can be considered lost. If he comes out of the seminar unscathed by a sense of responsibility, or worse has been made less dependable by its freedom, then it has not been worth while. (S)

PROBLEMS

selection

It has at times seemed tempting to collect each fall all the seminar applications, put them in the wastebasket, and assign to a seminar every student who did not apply. Our present system of populating the seminars depends mainly on a process of self-selection in which qualities that the seminars are designed to generate are almost presupposed. Some students apply because it is the thing to do, others have been told that it might be good for them. But most bring with them into the seminars intellectual curiosity, a habit of venturesomeness, some objectivity about their own education, or all three. ("Had I been more apprehensive about my ability to cope with Harvard, I probably would not have dared to apply.") It is clear that the seminars can exploit those qualities as well as generate them, but having convinced ourselves of that it is tempting to wonder whether with some different process of "selection" more might be accomplished. But this problem is endemic to education in selective colleges and is unlikely to be resolved here.

Two improvements, however, seem suggested:

> 1) We should attempt, if the program continues, to make the application procedure less forbidding, and we should devise better ways of enabling students who did not apply during the summer to case the program in September and apply then. (Some who had applied, given the same opportunity, might wisely opt out.) The freshman advisers would surely continue to carry most of the responsibility for such guidance, but it might be wise to find ways of allowing the students to advise themselves by exposing the seminars to the kind of "shopping" that is done in regular courses.
>
> 2) 61.7% of the control group report now that they wish they had been in a freshman seminar. It may be that for those who tend not to apply as freshmen we should consider providing similar opportunity a year later.

But if the seminars continue, and retain their present goals, it will be of most importance that whatever their selection process they remain voluntary and open to all students. Tutorial, it was suggested in General Education in a Free Society, is to be "for those whom Jefferson called 'the best geniuses,' for those students who are concerned with quality as well as amount of learning, with ideas and with values, those who have questions to which they seek answers, and who have the capacity and willingness to work toward a solution of those questions." (Tutorial, happily, has not in practice been so confined.) It is our conviction that if the freshman seminars take that as their principal direction they will lose what has to date been their greatest value.

rapport

Seminar leaders have occasionally underestimated their students' respect, and desire, for rigor. In their concern for rapport they have failed at the start to get the work of the seminar mobilized. And they have discovered later not only that it was difficult to shift then from looseness to rigor but that the warm environment they had sought to create had after a while nothing to hold it together.

Intimacy and spontaneity occur no more or less naturally in the early weeks of a seminar than in the first hours of any other acquaintance. In the seminar, as elsewhere, genuine rapport grows most durably out of common endeavor, and the more challenging the endeavor the better.

The freshman seminar, furthermore, is for the student a strange experience, and he therefore is eager to understand it as soon as possible in the terms with which he thinks of the university. By and large he wants to be challenged and he wants to have to work, and if the seminar fails initially to satisfy those wants he will either lose interest or begin to define it in terms that have little to do with its intended purpose.

Yet the freshman's basic need to respect himself as a serious student and the college as a demanding teacher is generally accompanied by an at least equally basic need "to find and to feel deeply those human attributes one has traditionally associated with liberal education."

> For both the average and the very able student, the cold and cutting edge of intellect -- the frightening force of rational analysis which spares no sentiment and overlooks no flaw -- must be counterbalanced by a trust in human relationships. (F)
>
> But our danger is that by over-concentration on the virtues of precision, by keeping them schoolboys too long (though in the best of schools) we squeeze out all the natural juices and turn out bright, able apathetic human beings who have learned that the various systems in which we are so skilled are everything and that they are nothing. (F)
>
> Faculty who helped to shape the role aspirations of these [PBK] men, then, were those who reached them on this double level of thought and feeling. (F)

Sensitivity and warmth and personalness and spontaneity not only are in order in a freshman seminar, they can create a useful climate for rigorous work and themselves provide, in the context of that work, important education.

What we have meant to say here is simply that these qualities grow best spontaneously and out of rigor.

disorder

I'm afraid that to a certain extent the difficulty I found was due to my being continually seduced by the fascinating nature of the kinds of issues that were raised in seminar meetings more or less ad hoc which always seemed germane, more interesting, more capable of leading to significant insights than the kinds of issues that I could think of to impose upon them. To a very considerable extent I feel that my response was a correct one and that very often these discussions did have a kind of value, but on the negative side it did set up a pattern which became the expected thing and made it increasingly difficult for me to impose a structure when this more spontaneous kind of system began to bog down and wear out. (F)

This is awfully structured if it's supposed to be a non-course and awfully hodgepodge if it's supposed to be a course. (S)

The teaching of literature seems to me to involve as much the communication of enthusiasm as the communication of a specific body of facts. With the students who are now in this seminar -- with the students who are now in any seminar, I should think -- this is somewhat less difficult, and perhaps somewhat less important than it is with a large lecture group, especially the very mixed group that turns up in a basic humanities course. They are already enthusiastic: if anything, they can get too enthusiastic. While fun, the discussions can too easily go off on tangents, involving everything from the history of religions to the comparative value of American and foreign films. The role of the seminar leader, therefore, involves the communication of the intellectual discipline without which enthusiasm simply runs wild. I don't mean "facts," precisely: "intellectual discipline" seems to be the only phrase which will cover it. It is what the intellectual discipline I can muster that I have tried to provide in the seminar meetings: some of the students respond to it very quickly; others seem to regret a little longer the vanished prospects of a somewhat directionless bull session. On the whole, I have been delighted: the group I have been working with seems quite eager to find some forms and some methods with which to shape their own excitement and their own perceptions. I couldn't really have asked for more. (F)

The restrictions were few, consequently the opportunities were unlimited -- I am not sure but that the restrictions were too few. Little if any attempt at motivation was attempted. Whether or not this was good, I will not say. I will only say that I felt its effects. (S)

Originally, I was quite critical of the seminar because it seemed to have a very loose structure, no required reading, a lack of formal systematic approach, and none of the methods of prodding and evaluating which other courses use to make one acquire a given glob of knowledge advertised in the catalogue. Now that I look back, this was the great quality that the seminar had. Taking courses is very much like shopping in a super-market: my seminar was like a trip to the packing house. (S)

I didn't expect the independent study to be quite so independent and occasionally felt a little at loss for guidance -- but I think this freedom was valuable in forcing me to develop efficient independent study habits. (S)

Such a seminar might, nay would, be improved if it evolved and used *any systematic approach* to its task. (S)

Since the seminar did not start out with a defined approach to the analyses which were undertaken, I had to develop approaches for myself. I feel that I

> have gained a good deal of contact with the sources of original thought in myself. (S)
>
> What I did not enjoy was paying money, and a great deal, to sit in the seminar every week and hear students haggle on trivial issues. I think that the seminar leader should lecture for perhaps three quarters of the seminar time, then direct the discussion. This was not the case -- our seminar went rampant, discussing everything from God to Kennedy's program of socialized medicine. (S)

As freshmen, 25.6% of the students found in their seminars some "lack of organization, focus, structure." Though it is clear that their feelings here and those of their seminar leaders are, especially in retrospect, ambivalent (they in one breath find this lack worrisome, invigorating, dispiriting and challenging), it is also clear that the work of some seminars has lacked coherence and direction. No other criticism recurs with such frequency.

The shading here is important -- the students ask first for a sense of structure and direction, not for structural trappings. They do not want grades and quizzes or mechanical assignments; they do want to feel that the enterprise has direction and coherence. Now trappings are relevant, because in the students' past experience it has been often mainly in the trappings -- in assignments and quizzes and orderly outlines -- that they have seen structure in their academic work. A seminar which starts in September with some immediately intelligible questions to pursue, and some well selected reading to be done because it is necessary, can seem tentatively structured by those pursuits themselves during the weeks which may be necessary for the essential substantive structure of the seminar to be come apparent to the students. And there is no getting away from the fact that an intellectual inquiry, whether in September or April, needs to have discernible direction. The students want depth, they want respect for their initiative, they want personal contact, they want freedom to explore; but they want these things in the context of a coherent inquiry.

In some cases this failing has been a matter, simply, of lack of preparation by the seminar leader. He has felt "Oh well, what I'm going to do here is simply sit down and explore with the students the things which interest me about my field -- therefore the seminar needs little advance thought and planning." What he fails, in these cases, to realize is that exploration requires planning, that the central questions and the important kinds of knowledge that he takes for granted in his own inquiries may not be self-evident to the student, that the student may very much need, as the seminar leader perhaps no longer does, an explicit sense of what the inquiry is built on and why and where it is going. To have that kind of sense in his own mind may not require planning on the part of the seminar leader; to impart that sense to the student inevitably will.

undemandingness

It is our impression that few seminars have yet discovered the limits to the amount of learning a freshman is capable of in this kind of environment. The reports from students suggest that in many seminars, though the work was challenging, the pace was undemanding. In some, relaxedness was plainly excessive:

> I expected to be expected to do much more work than I have. There has been a lot more talk and a lot less action than I expected. (S)
>
> The loose organization of the seminar has provided "a good, solid, gut." (S)

In most cases, however, the reaction has been less that "we accomplished too little" than that "with the head of steam we developed we could have accomplished more."

One of the concerns of those who created the program was that in the freshman year there was too little time and too much pressure -- inadequate opportunity for the student to relax, to think, to read on his own, "to write a letter or read a newspaper or follow some interest beyond the curriculum." It was not intended that the seminars should demand less work, but that the work demanded might seem somehow less alien to the normal pace of life, that it should be more a part of the student's life than something imposed upon it. It is clear from the reports of students that this result has been often achieved, that they have thought of the work of the seminars often almost as an occupation. ("The problems raised in the seminar formed the basis for most of my off-duty thinking.") What we are suggesting here is not that this should change; rather that once a seminar has thus engaged its students' minds it may be possible to accomplish, without increase of "pressure," more than the seminar leader may have been accustomed to expect.

> It would have been of much greater value if credit had been given -- not for the sake of greater incentive, but to provide the necessary time. (S)
>
> Always make them for credit. A lot of people here are paying a lot to go here and they know it. They therefore want to be sure that what they do will be worth their while. A non-credit seminar sounds like something PBH would put on: very well meant and undoubtedly interesting but probably slightly amateur and extracurricular. Whether or not this is the case is irrelevant. (S)

Non-credit seminars, with some exceptions, have been significantly less successful than those carrying credit, and the program as a result has offered fewer each year. Credit is the currency with which students purchase time; it is also, unhappily, their validator .. intellectual enterprise. Though the incoming freshman may initially feel sure he can take on almost anything, he is quickly confronted by real or imagined crises and the non-credit seminars suffer. They may have definite value, particularly in the sciences, for students exceptionally excited about a field. But where the seminars intend to ask of other students serious and sustained endeavor they will want, in most cases, to offer credit.

CONCLUSION

> It should be remembered that when children come to school they want to learn to read. It is good sense to capitalize on this desire at once. (from Learning to Read /A Report of a Conference of Reading Experts, with foreword by James B. Conant/, Princeton, 1962.)
>
> Traditionally language deputizes for what has to be absent. It tells us what we might see or hear. But too often it gets in the way of, or replaces, all that could give it a meaning. "Through the words I have mastered, I have come to appreciate the beauty of the great outdoors," said a favorite "Pupils' Creed" written for eighth graders. Today there is a better chance of turning the poor pupil right side out again. Now that the things and events themselves can be brought to us , the role of language is reversed. Instead of words having to explain or represent things, it is rather things, and actual processes taking place before us, which explain words or call them into question.(GE)

At least two of the freshman seminars have attempted quite successfully to evolve the structure of a discipline with the aid exclusively of the participants' powers of reason and observation. Though this is a logical extension of our feeling that texts and sources are educationally better than penny outlines, it is not an adequate or appropriate form of introduction to most areas of inquiry. In general, freshman seminars have been less ascetic.

What they have, however, tried to do is to provide, with respect to an area of study and to the university at large, close and early confrontation with key kinds of knowledge and question and process. They have tried, for the sake of engagement and understanding, to take freshmen to the heart of the enterprise and involve them there, actively, in its work.

This is no new "method" or experiment. It is as old as progressivism, rightly understood, and no newer than the new teaching in the schools. In PSSC physics, with its emphasis on discovery by the student; in the language laboratories, in their constant demonstration of the student's ultimate capability; in the new math, and its initial rejection of what only stands for math; in the resurgence in the "new reading" of "whole words" along with phonics; and in the early emphasis, in team teaching, on discourse, and the interrelation of subjects, the "method" of the freshman seminars is foreshadowed. It is not a new method, and it is not, in any extended context, a radical experiment. For, like the new teaching in the schools, it depends from, and aims principally to strengthen, the more traditional instruction that must follow.

IV. SCIENCE

At the freshman level the study of science walks a perilous tightrope between shaky pre-conceptions and a remote profession. To provide real and early insight into the nature of science is as a result critically important and extraordinarily difficult. As much or more so for those who profess no interest in science as for those who come to it "committed."

The typical argument against freshman seminars in science suggests, and then misses, the difficulty:

> One cannot discuss Japanese lyric poetry without first acquiring some knowledge of Japanese.

The difficulty is not that an understanding of the poetry requires a familiarity with the language. If that were all the difficulty there would be no problem. The problem is not only that the poetry needs the language but that a grasp of the language, and interest in it, may require a prevision of its poetry.

Freshman seminars in the natural sciences have sought to provide early and challenging demonstration of the nature of science and of scientific inquiry. They have in no case been seen as a substitute for courses. We have felt simply that early insight into the enterprise of science, achieved through engagement in serious investigation in association with an able and infectiously interested scientist, might provide students a sounder basis for choice of field and make subsequent course work in science more meaningful.

And we have thought too that such experience might rather directly strengthen the introductory presentations of some fields. In an earlier era, when science was more largely descriptive, and experimentation less subtle and complex, the introductory course in biology, for example, could quite intelligibly represent by lectures and simple laboratory work the enterprise of that neatly defined field. The field is no longer so neatly defined; its professional concerns and methods are less intelligible. The importance of extensive knowledge has thus increased, and placed increasing demands on the curriculum. But at the same time, and for the same reasons, there has appeared increasing need for live and early representation of the workings of the field.

There have been many problems.

The most critical has had to do with preparation and timing. We had presumed, four years ago, that any student with a reasonably good secondary education could as readily profit from a seminar in physics as from a seminar in drama. What we failed to note was that to the humanities and social sciences, despite the worst of schooling, almost every student brings considerable familiarity. He has lived for 18 years in an environment that has obliged him to make constant discoveries and constant judgments in the areas of humanities and social science. And it has obliged him also to read. With that background and that basic skill almost any student can enter a well-devised seminar outside the sciences and work profitably from the start. No one terms himself a "non-humanist" or "non-social-scientist" -- such immunity is impossible.

Many students consider themselves "non-scientists." By which they mean that they have never been obliged to comprehend their physical surroundings. To get the car keys from father and take one's girl to the movie was a social-science-and-humanities-process. One could be safely home again without having understood either the chemical structure of gasoline, the physical chemistry of combustion, the theory of optics and vision, or anything much about biology. Those things, for the most part, one learned in school, and unless one gained some grasp of them there one had no grasp.

Hence the problem of the freshman seminars in the natural sciences. We have said of many humanities and social science seminars that "there are no prerequisites." We might have said "An ability to read and some acquaintance with human beings and their preoccupations will be required." So, in science seminars, we have necessarily required some acquaintance with the language and preoccupations of scientists, which is to say some serious study of science done in school. Where we have not required that, and have failed to provide it in an organized way within the seminar, the student has profited as little from the experience as if he had entered the seminar in drama unable to read.

> Does the science seminar have a place in the curriculum? Yes, definitely. It should help a student who is questionable about following science decide whether this is truly the field that interests him and perhaps give him insight into whether or not he can satisfy its intellectual requirements. The difficulty with this person taking such a seminar, however, is that he must for the purpose choose a rather narrow field, and the seminar is therefore always a gamble. Even if such a person should decide to pursue science further, he has used up one course which must be made up in required science courses

> and therefore cannot be used in other fields -- fields which he was obviously interested in or he wouldn't have been undecided about being a scientist in the first place. The problem is largely with the student, not with the courses. I wish I had taken a seminar. (from a student concentrating in physical sciences)

The problem of preparation is closely related to the problem of curricular pressure. Unlike most fields in other areas, many of the sciences require a highly articulated sequence of courses that must be planned and undertaken early. And that sequence not only allows little diversion; within itself it demands unusually much time. Thus the typical freshman, at once more sure of his commitment and more awed by the requirements than he may be a year later, is uninclined to risk excursion into a science seminar. The applicant to the seminar is more likely to be the student who along with feeling sure of his commitment to science was so well prepared in school that he knows he can afford the time. And as a result of the vast preoccupation with high school scientists he is likely to be the student who after one summer at Brookhaven and another at Woods Hole least needs the opportunity the seminar offers.

Others who apply are by nature or necessity dilettantes. And some, who refuse to adhere to this account, apply with serious interest, poor preparation and remarkable courage and by dint of earnest work and skillful teaching profit immensely from the experience. By and large, however, the prospective scientists who might most profit from such opportunity have too seldom been attracted or well-served.

The same is true of "non-scientists." "Non-scientists" with good school background in science -- and there are many -- could have undergone, in a number of the seminars we have offered, important contamination. And though they would not, by and large, have gone on in science, they might have taken away useful insight and an informed respect for scientific work.

They rarely applied. The rule, which serves often by its very existence to deepen prejudice, says they must satisfy the General Education requirement by taking a lower-level GE course in science (or, normally, two full departmental courses). The seminars go by the board, despite considerable feeling by such students, in retrospect, that the experience might have been useful.

> Harvard is first of all a liberal institution, and within this framework such seminars serve an important function, introducing, first of all, the real scientist to the real nature of scientific inquiry, and, perhaps even more importantly, allowing non-scientists to learn how science works. (S)
>
> Seminar instruction provides the non-scientists an opportunity to examine intellectual presuppositions of science instead of simply slogging through courses that are essentially pre-professional. (S)
>
> For the non-scientist, the small group where independent work is encouraged is one of the few ways which might foster an interest in science, and more important, a respect for science. The most serious deficiency in the curriculum at Harvard is that it allows a lack of respect for science because so few people have more than a vague understanding of scientific problems and their importance. (S)
>
> I wish that there were more for non-scientists, and the inexperienced; and that they carried lower level Nat Sci credit. (S)
>
> The scientific method is applicable not only to the natural sciences but also to the social sciences and humanities, touching upon almost every field of endeavor. (S)

Furthermore the seminars have been demanding of faculty time, particularly where independent laboratory work has been involved. Although science has no monopoly on the explosion of knowledge the pressure on the scientist to keep up with his field is especially unremitting. Combined with the pressures of teaching and research it may make the demands of a freshman seminar seem entirely unmanageable.

> When I gave the course, I asked myself how much of what I presented could have been taught to me by Professor______________ 21 years earlier. The answer was a quarter; three fourths of the papers I cited had been published since I had attended his lectures. The rate of growth in biochemistry is faster; half the references in the second edition (1958) of Fruton and Simmonds are to literature published after the first edition (1953) had gone to press. ... In addition to the attention they must give to the flood of new literature, scientists today are being asked continually to broaden their base of operations. Two generations ago, organic chemistry was distinct from physical chemistry and from biology, and certainly divorced from physics. Today, the individual disciplines are still well established, but numerous connections have grown up among them, and each of us must somehow grasp new developments in diverse areas. (F)

> I was given a room in the laboratories and was told that I could have whatever equipment, within reason, I wanted for my project. This opportunity exceeded my wildest expectations and greatly encouraged my interest in the field. (S)

And science seminars, finally, like all instruction in science, are demanding of space and money. Under the conditions described above almost any student could become interested in anything -- we cannot justify seminars on that basis. The departments have the research of their faculty to house and that of increasing numbers of post-doctoral fellows. Somehow the demands for lab resources for teaching must be balanced against the need for facilities for advanced research, and one student/one lab cannot often be the answer.

Despite the difficulties, however, we have successfully offered 36 seminars in the natural sciences. (They are described in the Appendix.) Their organization has depended upon the nature of the seminar's subject, the abilities of the members, the instincts of the seminar leader and the availability of facilities. They have varied principally with respect to the commonness or independence of the students' work and the extent of student engagement in research:

> independent reading supplemented by group discussion and by observation and discussion of relevant research
>
> common reading, group discussion and observation of research
>
> individual research apprenticeship (i.e. assisting with the work of an existing research enterprise) supplemented by individual, guided reading related to the research
>
> independent research, plus common reading and discussion
>
> common research (i.e. one project on which the members of the seminar collaborate), plus common reading and discussion

With respect to method the most common failing has been neglect of context. We have too often done in science what we do not do elsewhere: We have set the freshman to work on a quite independent inquiry (though sometimes in the role of an apprentice) without providing him adequate opportunity to understand his work's relation to the general field. It is dramatically clear in the students' reports that the best incentive to understand an area comes from entanglement in it, but in science we have too often failed to exploit that curiosity in any orderly way. In the humanities and social sciences we have typically sent students off on their own, but almost always from a base in a broader and common inquiry. Their independent investigations have grown out of the common inquiry and have fed back into it, and the student has thus been able not only to cover more ground but to profit in his individual investigations from the experience of other students. The isolated scientific project, conducted with little discourse and in a narrow context, has been valuable, in many cases, for the exceptionally precocious student. It has enabled him to go very far, at his own pace. But the best science seminars, for the majority of students, have been those in which independent or semi-independent work has been related to a wider and orderly common inquiry. Both kinds of opportunity can be valuable; the second, appropriate for more students and more difficult to create, needs more attention.

Because of the difficulties noted, the response of faculty and students to their seminar experience has been more mixed in the natural sciences than elsewhere. And partly because of the heavy importance that often has rested on the selection and progress of individual research projects reports from within the same seminar and from the same seminar leader in different years have tended to be erratic. The difference in response, as between areas, is suggested by the following comparison:

> "Based primarily on your experience in your particular seminar, but also on your impressions of the seminars generally, would you be inclined to recommend participation in a seminar to a member of next year's freshman class?"

	no	perhaps	yes
natural sciences	6.0%	26.3	67.7
social sciences	1.0	10.9	88.1
humanities	---	15.2	84.8

Nonetheless both scientists and non-scientists, both/in the seminar group and in the control group, seem to have thought well of such teaching:

> "We have offered, in the past four years, a variety of seminars in the natural sciences, seeking to provide live demonstration of the nature of scientific inquiry. Those seminars

> perhaps could not, and in any case have not attempted to, fit substantively into the articulated course sequence required in most scientific fields. As a scientist, or as a non-scientist, do you feel that such instruction has any place in the Harvard curriculum? If so, for what kinds of student, and in what better forms than we have offered? (see enclosed descriptions of the science seminars)"

	for most anyone	for mainly scientists	for mainly non-sci.	for them what wants them	likely for no one	definitely for no one	don't know
graduates of sci. seminars	67.1%	22.7	1.1	3.4	4.6	1.1	---
sci. concentrators: control	36.1	37.1	3.1	11.3	9.3	3.1	---
other seminar graduates	63.2	13.9	5.5	6.2	6.3	.7	4.2
other control	46.3	26.2	5.0	14.4	4.4	.6	3.1

The comments of faculty and students note two results that are comparable to those of the seminars in other areas. The students note a third that may have special significance in science.

1. re. understanding the nature and process of science

> Concentration in science is like a dull trip to some scenic wonder. The person who remembers his destination doesn't mind the trip at all. Someone like myself, who forgets his destination, or who doesn't know what it is, is bored to death by the trip. (S)
>
> I think I learned what a scientist is and how he works. (S)
>
> It is not the primary purpose of this seminar to teach us facts, although I think that some of us have learned a good many. What I learned was more a sort of skill in thinking. I have learned how to approach a problem, how to isolate relevant factors and test them, how (and why) to set up adequate controls. More important, I have learned how much it takes to constitute a real proof. (S)
>
> The aspect of my seminar that made it particularly effective as a part of General Education was the opportunity to be associated with a group of men actively engaged in scientific research. This was an experience for which no course, no books, no "laboratory experiments" can substitute. (S)

> It considerably deepened my understanding of the interplay between experiment and theory. (S)
>
> In my chem course and chem labs, both of which I enjoyed tremendously, the emphasis was on precision, exactness; theories and techniques were delineated in such a way that I thought them to be exact, perfect, infallible. My experience in the seminar and my conversations with my professor have shown me that science is not so carefully laid out. (S)
>
> (And at least one student discovered that the problems involved in laboratory research are not always scientific:
>
> A critical problem has been the amazing speed and efficiency with which assorted people evaporate with my apparatus. I have spent almost half my time trying to locate various pieces of my equipment. I use a microscope, which I can understand missing, but when somebody swiped one of my meters and tied it up for a week and another nefarious character made off with a special syringe, I become annoyed.)

2. re. choice of field

The impact of science seminars on choice of field has been reported in Chapter II. It should perhaps be underscored here, however, because it seems particularly a problem in the sciences, the danger, inherent in certain seminars, of premature commitment or retreat. It is our impression that in general the seminars' impact on choice of field has been constructive. The reports of occasional students, however, give us pause.

> This early sense of security in biology [gained in a science seminar] has not been borne out, and I now wish I had not majored in it. (S)

3. re. science as a human enterprise

> In asserting the centrality of learning I am asserting also the proposition that what a university department in the sciences must teach -- essentially -- is not science as a subject but science as a way of life. The first and greatest requirement for good work by students at all levels is that they should feel the meaning of scientific inquiry -- to the limit of their capacity. The right center of meaning is not, in my opinion, the nature of the universe, or the structure of matter, or even the shape of scientific "laws;" it is the nature of science as

> a human commitment. And for this the air of science in action is indispensable. (F)

> It seems valid to say that two learning processes are given equal importance in the students' scheme of things: the special claims of the intellect, the special claims of the emotions. This second, irrational grasp of reality, the understanding of man and his world, this human intuition and personal expression, is most often realized in courses in the humanities and social sciences. (F)

The scientist as a human being -- his motivations, his style of work, his frustrations and satisfactions and his non-professional interests -- is too often shrouded, in the popular view, in a white coat. It may be important because of that shroud, and because of the special problems of career decision in the area of science, to reveal the scientist as a human being quite early in our teaching. That the seminars have sometimes accomplished this seems important.

> Students must be made to see that science is a live process, not dead facts. Active personal participation is without doubt the finest way to acquire this understanding. The enthusiasm of faculty members while conducting research generally far exceeds their enthusiasm while delivering lectures -- and understandably so; to see the excitement and beauty of science many students need to see others experiencing this feeling. (S)

But despite considerable and varied success the problems of science seminars remain -- chief among them the difficulty, involving preparation and curricular pressure, of providing them for the right people at the right time. It seems likely that improved teaching in the secondary schools will solve this problem eventually, and all students will come to Harvard, as they come now to freshman seminars at MIT, conversant with the world of science. Meanwhile, having had only partial success in our efforts to use science seminars well, we could abandon the effort and leave the job of the seminars, in the natural sciences, to tutorial and GE.

That does not seem a useful solution.

Tutorial, in the first place, is not available to all students and where it *is* available pre-supposes commitment to the field -- it has been a key function of the seminars to *test* commitment or suggest it as a possibility. Tutorial, furthermore, views engagement in research as a *culmination* of undergraduate study -- the seminars have sought, with demonstrable success, to use it for introduction. And tutorial in the natural sciences has to this point been led largely by post-doctoral research fellows -- the seminars, if they are to serve their intended purpose, need as leaders scientists who are committed to teaching and to some extent to the College. Tutorial, in other words, though it serves an excellent purpose, cannot serve the purpose of the seminars.

Nor can GE. Though in the Red Book it was stated that General Education in science should be provided for future scientists, that plan has been largely abandoned. Students who are seriously considering concentrating in the physical sciences now rarely have contact with General Education in their area.

Our commitment to the seminar device, however, is based not on its peculiarity but on its apparent strength. The problems freshman seminars have confronted in science have been largely circumstantial. We believe that if their relationship to the science curriculum could be made more articulate and flexible they might serve very powerfully prospective scientists, some prospective "non-scientists," and the interests of the departments and GE.

To illustrate:

1. for the precocious and firmly committed scientist

There are no serious problems here. He is ready as a freshman for research experience and the departments are for the most part glad to have him. He can work for credit or not as seems best; he is not under curricular pressure. The only important function here of the seminar program is to make such opportunity more available and more visible. That may involve not only finding places for independent work and good people to accept apprentices but more effort than heretofore to create "collaborative" seminars, in which a number of such students, more economically and with benefit of discourse, might undertake jointly, with substantial guidance and reading, a common investigation. It will be wise, in creating opportunities for such students, to seek areas, particularly at the juncture of disciplines, with which the schools are for the most part ill-acquainted. It is likely otherwise to be harder to dispel entrenched misconceptions, acquired in school or in a Westinghouse project, about the ways in which science operates. And it will be wise, too, where students are deployed individually about a department, to bring them together periodically, with each other and with other people at work in the field, so that they may see what they are doing in some wider context. Finally, it will be necessary to demand occasionally of such students that they go instead and take a course in Russian literature.

2. for other prospective scientists

The thing we would note about the precociously committed and gifted scientist is how he got that way. In case after case that we have looked at he got that way not because he was seduced by the material of a high school course but because he had had opportunity, in a course or out, for close association with someone for whom, infectiously, science was a way of life and/or for personal entanglement in what for the student, at least, constituted real research.

If a student comes to us so ignited we are often marvelously hospitable. But we seem to say to others "Fine if you could have come to us an already-engaged scientist. But since you did not we shall have to defer opportunity for such experience until you are at least a junior or senior." We thus neglect the fact that it was just such experience, occurring early in his study, that got the "precocious" student engaged.

a. We might do well to offer more spring-term science seminars, related or unrelated to a basic course. The students would thus usually have had some college-level science, and some familiarity with its language, organization and concerns. And if the seminar were related to a full-year course they would have a substantial and important common background. Such a seminar might involve

   1. a common research project based on common readings and discussions;

   2. discussion, considerable common reading, and individual projects closely related to the wider, common inquiry;

   3. research apprenticeship, and related reading, augmented by an occasional seminar meeting at which students would hear from faculty about special topics or current work and from each other about their own projects' aims, methods and problems. (It is an incidental virtue of such in-gatherings that they can effectively strengthen, or at least save from disaster, the occasional apprenticeship experience that will not work out as planned.);

   4. a seminar based largely on reading and discussion, with some research observation. This requires, if

it is to serve its purpose, the extraordinary teacher who can vividly convey a sense of the nature of scientific work without getting the students actively engaged. (It will help if his own research apparatus is making bubbling noises across the hall.)

In each of these cases it will be important that the inquiry, whether common or individual, have most of the features suggested earlier on page 19 . In each case, also, it will be important to leave loop-holes through which the student who develops serious interest in a relevant and manageable investigation can move out to independent work.

b. The problem of curricular pressure can be somewhat evaded by means of low pressure, non-credit seminars. In general non-credit seminars have seemed severely handicapped, and we would not recommend them in other areas. For two reasons, however, beyond expedience in the face of curricular pressure, they seem appropriate in science:

   1. The unusual strength of many freshmen's initial interest in science has managed to carry them far more perseveringly thru non-credit seminars than has the interest of students in other areas who have enrolled in similar seminars.

   2. It is evidently possible for the prospective scientist to gain important insight into the area from association, almost by itself, with an interested and able scientist. And that insight thru the scholar as person seems in science, for reasons we've suggested, peculiarly important. Thus much may be accomplished by an unintensive seminar provided it affords the student this association.

c. But not all students are ready for such work as freshmen. Our decision that the seminars were to be for freshmen was fundamentally right, but with more refinement we should perhaps have said that they were to serve freshman needs. In the humanities and social sciences the difference is not critical, for regardless of students' background they share a common language and heritage with the result that "freshman needs," in those areas of study, can usually be confronted profitably in the freshman year. But with respect to the sciences we would have done well to pay less heed to institutional chronology and more to the chronology of the individual. For "freshman" status in the sciences, in terms of readiness for engagement in the area at a university level, comes for some students in the junior year of high school and for others, for reasons we have mentioned, only after basic courses in the area have been completed in the freshman year.

1. We might usefully consider seminars, similar in form to those above, but organized in a way that was proposed at the program's start by Professor Holton:

   > "The seminar would begin and conclude in February, providing
   >
   > a) a term beforehand of basic familiarization in Physics 1 or Nat Sci 2, and concurrent runs of the 1st half of the seminar with the 2nd half of the course.
   >
   > b) more reliable evidence for the selection of participants (to be made on the basis of interest and aptitude rather than of precocity).
   >
   > c) a charged interlude between June and September to which participants might conceivably respond by independent reading and study related to their work in the seminar."

2. And might we consider, also, on a small scale, opening science seminars to sophomores? To those students, that is, who have completed their freshman year before reaching the stage of preparation, curiosity and susceptibility which many of their classmates reached as freshmen or before?

3. Finally, we should surely experiment further with seminars at the boundaries between science and other areas. We have in mind here, especially, the uncertain "non-scientist" who could profit from the experience of standing on a piece of ground where his footing felt secure and examining the natural sciences from that vantage. Such opportunity is already effectively offered in Professor Mendelsohn's seminar on the history and social context of modern science. Perhaps other students should have similar opportunity.

(Scientists too might enroll and gain from the experience new understanding of both their own and another area.)

> ... through such seminars scientists and non-scientists might learn much from each other and discover grounds for communication which would affect their whole experience in the college. (S)
>
> What I would like to see would be one or several seminars dealing with the history and philosophy of science. In other words get the prospective scientists on top of instead of under the thumb of their disciplines. (S)
>
> Science instruction in general education should be characterized mainly by broad integrative elements -- the comparison of scientific with other modes of thought, the comparison and contrast of the individual sciences with one another, the relations of science with its own past and with general human history, and of science with problems of human society. (General Education in a Free Society)

A source of incohesion in a number of early science seminars was precisely our failure to identify for the students which seminars were meant to serve whom. Uniformity of academic preparation does not so much matter in other areas -- a good background in literature does not make it a waste of time to discuss Chekhov with seminar colleagues who have less good background. They can to a fair extent understand and contribute regardless. Uniformity of preparation, in a science seminar, can matter very much -- a "beginner" is more of a beginner in discussing physics than in discussing Chekhov. Which suggests that whatever form science seminars take they should make clear what sort of background is required.

The constituency and impact of seminars in the sciences will continue to depend upon the way in which the credit granted by the seminars gets related to curricular requirements -- to some extent on its relation to departmental requirements, but principally on its relation to GE. To the extent that an appropriate seminar in science can help to meet the lower-level GE requirement it will attract the less, in addition to the more, committed. And to the extent that such credit is not obtainable the seminar will attract less undecided students and become in its effect more special. The relation between the seminar and the lower-level requirement affects not only the seminars' place in the plan of study; it affects also, and more importantly, their constituency and shape, their "disposition toward revelation or acceleration." Lower-level credit has that role in every area; it is most effective in the natural sciences.

V. SPECIAL ISSUES

1. "Seminars are for the precocious."

It was widely assumed, when the seminars began, that the students who would profit most, and at whom the seminars should therefore be aimed, would be those who came to college with an exceptionally informed commitment to some particular field of study. In practice, however, the seminars have seemed as profitable to the student who is primarily curious as to the student who is "precocious:"[1]

a. Among those who applied to the seminar "because I was unfamiliar with, and interested in exploring, the general area with which the seminar seemed concerned," 65.4% report what we have termed in this study "relatively much profit" (corresponding to answers 6, 7 or 8 under question 24 of the follow-up questionnaire, Appendix IC).

b. Among those who applied "because of a strong pre-existing interest in, and acquaintance with, the particular field of the seminar," 61.1% reported relatively much profit.

The reasons for the insignificance of the difference here have been suggested in Chapter II. They have to do mainly with the fact that in this college important precocity has more to do with qualities of mind and of motivation than with special preparation. Those qualities the seminars have sought to generate, not require. The evidence, from the accounts of both faculty and

---

[1] the student who, in the terms of this study, comes to college with "relative to most other entering freshmen an exceptionally serious and well-informed interest in some particular field of study"

students, is that the program's non-"honors" orientation has made sense:

	would not recommend seminar	would recommend seminar
high PRL or SAT	2.5%	79.7
low PRL or SAT	2.3	82.4

Are freshmen unprepared for seminars? No -- unconfident, unread, but not unprepared. ... by helping the student to discover his abilities early, the seminar makes it possible for him to take much greater advantage of his later opportunities at Harvard. (S)

"Inadequate preparation," if it really is that important (for what courses at Harvard are you adequately prepared?), is a great advantage, actually. It gives the freshman an openness, an absence of someone else's theories and patterns of thought. A freshman can get excited about a new kind of thinking or a new field in a way which an upperclassman, already committed to a field and more certain about what he wants to learn as opposed to what he can learn, cannot. (S)

You ask in your letter for my reactions. ... First, I am more convinced than ever that young, intelligent people can cut through the pretentious aspects of the social sciences with delightful clarity and precision. Second, this particular group, at least, showed a tolerance for ambiguity, an ability to suspend judgment, that I wish I encountered more often in their "elders and betters." (F)

One doesn't learn how to budget one's time, how to think constructively, how to get at what scholarship is about by being told by a lecturer, by talking about it or even by becoming a Sophomore. One does it by doing it, and more subtly, by being allowed to do it and missing the opportunity. Therefore, I think that whether or not a student is "ready" for a seminar, he will gain by it. If he gains factual knowledge, fine; if he gains a better understanding of what it is to learn, fine; if he goofs off and realizes what he has missed, still fine. The only way he can lose is if he remains totally detached from the seminar, and this is the problem of the leader, not of the student. (S)

It is precisely because freshmen are so inadequately prepared, especially in terms of personal and intellectual maturity, that they are most in need of the freshman seminar. (S)

Perhaps my intellectual immaturity is brought out by my inability to carry out a project of independent study as suggested by my seminar, and by my failing interest in the seminar,

> but the only way that I will mature intellectually will be through experiencing problems such as those offered by the seminar program. (S)
>
> I think that it is important for people without the full requisite of factual knowledge to begin thinking in ways that will eventually come more fully with intellectual maturity. Unless they do, they will reach the point where they are stuffed with knowledge and have had no practice in doing anything with it. (S)

2. frontiersmanship

Some observers have worried that students in the seminars seemed too infrequently to be working at "real frontiers." They had thought it was the intent of the program to place freshmen at the forefront of knowledge in a field and engage them there in scholarly research. There are some practical problems in that approach, and a more significant problem that is semantic.

The practical problems have less to do with the freshman's ability to come to grips with problems at a field's frontier -- appropriate topics can often be found -- than with the availability of resources:

> Developments in the field are so recent that they have not as yet appeared in books to any useful extent. Articles in current scientific publications are usually too specific to be of any use as general background material. Because so much of the field is still speculative or theoretical, sources of published information are few and far between. The dozen sources of information are men currently working in the field, such as Dr.________________, who are up-to-date on the latest developments. This severely limits the presentation and discussion of information by the students. Dr.______________has to do most of the talking, because he is the prime source of information. The seminar method therefore has not made a great difference as concerns our approach to the subject or the amount we have learned. (S)

The semantic problem has to do with the definition of an "effective frontier."

The seminars have assumed that freshmen could as effectively become engaged in inquiry and as readily gain insight into the nature and methods of an area if they were led to what constituted for them a frontier as by induction into the preoccupations of scholars at a field's boundary. The "field's frontier" offered no special magic that the individual's frontier did not. Given the essential characteristic of research -- that the next step and the next answer are nowhere given -- it seemed likely that we would find often at untopical frontiers educationally pregnant topics.

a. 25.2% of the students said that in their seminar they had been working "at a real, if limited, scholarly frontier."
63.7% said that they had been working "at what was for me a frontier though perhaps not a frontier for scholars in the field."
11.1% said they had been working at no real frontier.

b.

	students report relatively little profit	students report relatively much profit
at a "scholarly" frontier	19.6%	62.5
at a "personal" frontier	17.0	61.1
at no frontier	42.9	36.7

But the semantic problem is simpler than we've suggested. Basically it is that "frontier" is a two-dimensional concept and that understanding is three-dimensional. Where is "the frontier" in the study of literature, or of history? The effective frontier, by the evidence of the seminars, is wherever we find challenge to understanding.

3. faculty rank

The program has sought as seminar leaders able teachers with infectious and wide-ranging scholarly interests. These have sometimes been senior members of the faculty; sometimes they have been junior.

% enrollment in seminars led by	59-60	60-61	61-62	62-63	total
senior faculty	84.2	66.9	50.7	58.1	63.2
junior faculty	15.8	33.1	49.3	41.9	36.8

The students' accounts -- we have no other basis here for judgment -- suggest no significant difference in the quality of seminars led by senior, as opposed to junior, faculty. The evidence suggests, if anything, more confident use than heretofore of excellent junior faculty.

	students report relatively little profit	students report relatively much profit
led by senior faculty	21.3%	55.3
led by junior faculty	20.9	59.8

The most powerfully effective teaching done in this program has been done often by Instructors and Assistant Professors. The reason for this is not that junior faculty are as a rule better teachers -- if a rule were wanted it would have to be that they are not. The reason is simply that in the junior ranks of the faculty it has been possible to be far more selective.

The distinguished Professor brings special qualities to a freshman seminar; so also does the extraordinary Instructor. The Instructor or Assistant

Professor runs less risk of over-awing, his learning and his grasp of problems may seem more attainable, and he may recall more clearly the needs of students beginning in the university and in his field.

The danger, in such instruction, apart from the problems already discussed in Chapter III, is that the seminar leader, because of the form of the enterprise, will forget that he is dealing with freshmen and that his aim is not mainly scholarly refinement but education of a very basic kind. Where that has been forgotten -- more often by senior than by junior faculty -- the seminar has wasted everybody's time.

> The other students were very ordinary and, frankly, they bored me. (F)
>
> I don't think the trouble is apathy; so far as I can tell they work hard and conscientiously. The trouble is rather that they are not up to snuff. (F)
>
> My freshman seminar was a failure, from my point of view. It resembled sophomore tutorial, except that the students knew far less than sophomores generally do, while their intellectual caliber was rather lower than that of the history and lit tutorial students to whom I have become accustomed over the past decade. I will never again give a seminar to freshmen. ... I can conceive of no legitimate reason for giving seminars to inexperienced, unread eighteen-year olds. (F)
>
> Seminars are not wasted time for the faculty so long as they expect not intellectual giants but freshmen. (S)

The search for excellent seminar leaders has been harder among junior than among senior faculty. But it should not for that reason (and we have found no other) be abandoned.

VI. THE FUTURE

We look for no radical general changes if the seminars are continued. They should retain their present flexibility, their emphasis on inquiry, their collegial environment, their voluntariness and gradelessness, and their commitment to the "general" aims of the College. Within that context, however, new developments might affect the seminars' substance, their methods, and their availability.

substance

> The program should offer an interdisciplinary study of an underdeveloped region, taking into account history, anthropology, sociology, economics, and government. (S)
>
> Why not a seminar investigating the ways in which social and historical evolution are reflected in the art of a period? (S)
>
> I have always intended to be a scientist, and last summer I felt that in order to decide whether I really wanted that I would have not only to know science but also to know what makes scientists different, if they are different as my experience suggested. I wanted to understand why so many people still distrust science, and whether science is leading the human race forward or to its destruction. This is why I chose this seminar rather than doing individual research in biology. I wanted to get a feel for the direction and meaning of science as seen from the outside before I committed myself to it; not to decide whether or not to become a scientist, but so all the science I studied would appear in a larger perspective. The seminar has given me this. (S)
>
> I would like to see a seminar given on the problems of representing modern society in fiction. (S)

The centrifugal inquiry in depth will remain important, but may profitably focus even more than in the past on topics at the juncture and boundaries of disciplines. It is evident in the past four years' experience that the nature and methods of scholarly disciplines become most meaningful and intelligible when they are discovered by the student in the course of an inquiry that is identified initially by the questions it asks rather than by its connection to a discipline. And preconceptions about a discipline may be easier to overcome if the student is brought to it from a new direction, through an eccentric inquiry.

> As for the process, largely inductive, of arriving at basic principles of musical structure and style by close analysis of a very limited amount of music: although it takes an inordinate amount of time to achieve very modest results, I still feel that the method is generally good. This year, in my zeal to keep everything under rigorously logical control, I made the mistake of limiting too severely the amount of music to be studied at any one time. The great disadvantage is that the students did not have the opportunity to acquire any perspective on what they were studying. This could be helped in a future seminar by paying more attention to history and aesthetics along with systematic theory. (F)

We may learn, also, how to introduce students more effectively to new areas without sacrificing our emphasis on discovery. We understand already one essential. It is that the student have a viewpoint that is not on new ground. That viewpoint can be disciplinary, "contextual," or topical: science may be approached by the unschooled "non-scientist" through study of the history of science; "the immigrant community in America" may be understood if it is studied in the intelligible context of a familiar city; nationalist movements in Africa may be understood in relation to nationalism in Europe and America.

method

We have begun already to discover the several values of engaging in the seminars, as faculty-aides, distinguished upperclassmen. It seems likely that if the seminars continue they will make better and wider use of faculty-aides.

Future seminars will be in general more demanding, particularly in their early weeks. But they will at the same time be more attentive to the value of change of pace.

They will not generally engage students in large and terminal independent projects without first providing, in smaller projects, practice in research methods. And they will find better ways -- involving timing and the design of projects -- of exploiting in the seminar as a whole the independent experience of its members.

They will make wider use of summer reading to introduce and explain their concerns, and they will sometimes offer, particularly in the sciences, opportunity in the following summer for practical experience.

availability

Because of the value of voluntariness -- with respect to both faculty and students -- we do not look for any strenuous expansion of the program. It may be that teaching machines, larger lectures and independent study will one day free faculty for more teaching of this kind -- meanwhile the program must be limited by the availability of good and interested leaders.

It should nonetheless be possible to accommodate more applicants than heretofore. During the initial years of the program seminar leaders have been free to accept as few students as they chose, and some have felt, justifiably, that five or six was an ideal number. The evidence, however, is that 8 - 12 can work effectively in most seminars. It would be reasonable, in the future, to encourage the leaders of over-subscribed seminars to accept more students than they have sometimes in the past.

> With the approval of the seminar leader upperclassmen may be admitted to any seminar, provided they intend to participate in it on a full and equal basis. (from the explication of the legislation passed by the Faculty in 1959)
>
> Many students, both freshmen and upperclassmen, are extremely regretful that they bypassed the program. (from the report of the Freshman Affairs Committee of the Harvard Council for Undergraduate Affairs)

As was noted in Chapter III, the students who might most profit from a seminar often lack, as freshmen, the initiative to apply. They decide too late that it might have been worthwhile. Among the members of the control group, now upperclassmen, 61.7% report that they wish they had been in a seminar.

Justification for opening science seminars to sophomores was suggested in Chapter IV. We would suggest here that although in other areas academic preparation may be less a problem "motivational" preparation may very much matter. And that it may therefore be wise to consider the possibility of admitting to freshman, or to separate, seminars sophomores who were not in seminars as freshmen.

It would be important, if this were done, to avoid confusion between the seminars and tutorial. They serve different functions, though in somewhat comparable ways. It has been a principal strength of the seminars that neither the student nor the seminar leader feels indentured. They are not meeting any departmental requirement, are committed to no externally defined coverage, and as students may participate whether or not they are committed to the field. Graduates of the seminars, while citing the merits of tutorial, have repeatedly noted the difference:

> Though seminars in the freshman year may not be the most effective method of cramming facts, they can be a very effective means of shaping attitudes. Tutorial and independent study are different in that they are means of utilizing already founded attitudes.
>
> My seminar was more interested in raising questions, tutorial in answering them.
>
> Tutorial does not benefit from the presence of students not committed to the field.
>
> My tutorial meets one hour every two weeks in a group of eight, for the apparent purpose of making sure we've read the assignment that is part of our preparation for generals. The tutor tries to bring out the main themes in the readings -- or tries to draw them out of us. The atmosphere is semi-formal, and the air heavy with departmental requirements.
>
> Tutorial has to do with a departmental job, which at least in my case, prevents it from permitting freedom to explore; it is also taken only in one's own department.
>
> My seminar involved commitment that was not oriented to the future, tutorial does not.
>
> Tutorial seems much more restricted than the freshman seminar. It is hard to change schedule to explore new interests that come up during reading and discussion.
>
> Tutorial has been more profitable largely because of my experience in the seminar.

The seminars have mainly to do with the general aims of the College. If legislation should open similar opportunity to sophomores it will be important to preserve this identity.

regularization

> In education, as in life, we cannot flee from distressing complexity and uncertainty. (GE)
>
> Education, like all society's prime needs, changes as society changes. (GE)
>
> In education, as elsewhere, it is cheap and easy to be unambiguous. (F)

The seminar program has sometimes been criticized for establishing a new form of confusion. The increasing "messiness" of the undergraduate curriculum -- including General Education, tutorial, Independent Study, advanced standing, advanced placement, and now freshman seminars -- has seemed unmanageable and disorderly. Better, some have argued, to have an orderly curriculum, where those pieces that cannot be homogenized can at least be neatly articulated and have a discrete and well-defined "policy."

It has been our feeling, in evaluating the freshman seminars, that neatness is a poor criterion, that the seminars need not be either-abandoned-or-required, that they need not, if they continue, displace any existing form of teaching, and that they provide no all-embracing or final answers. They have been an experiment that has had certain kinds of success in meeting certain needs. There are other needs, and will be new needs, and need for new experiments.

Complexity and tension and ambiguity are not in themselves undesirable. Managed creatively, they may enrich the curriculum and the experience of our students. The seminars, in their inquiries, have demonstrated that undergraduates can tolerate ambiguity and that ideas have more impact when they are evolved than when they are given. So with the curriculum. A neat curriculum, structured by requirements, may not be the best we can offer.

problem of cost

In four years the seminars will have cost approximately $252,125: $155,500 for faculty salaries, $53,300 for other direct costs of instruction, $43,325 for administration and overhead. The cost per student-term has been approximately $137.

It is difficult to draw accurate comparisons with the costs of "conventional" instruction because those costs are not known. It costs more to teach Chemistry 20 than to teach Humanities 2, less to teach freshmen than to teach graduates or upperclassmen; "typical" costs are nowhere determined. It seems probable, however, that the teaching accomplished in most freshman seminars has cost somewhat more than other teaching in the freshman year.

But such comparison may not be wholly valid:

1. Faculty and students have frequently noted what one student called the "multiplier" effect of the seminars -- "its effects on my friends and roommates." It may be that that effect operates more powerfully out of seminars than out of other teaching.

2. There is considerable evidence which suggests that what is learned in seminars is often better retained than what is learned in courses.

> Perhaps the most significant aspect of these ideas is that they continue to run through my mind. (S)

> What I have learned has thus far been retained far more effectively than anything culled from the other courses I am taking. Perhaps the main reason for this is the direct contact I have felt with the subject matter which, individually and with the group, I could manipulate until it became very real and personal. (S)
>
> I feel that what I have gained from my seminar experience has become more a part of me than just another course which one might take, get an A in, and then forget about.
>
> The examination seems to be a sort of breaking-off point between student and subject. As I reflect on our seminar, which had no exams, I can recall many of the details of almost all of our discussions, and I have a feeling that there is a smooth continuity in the whole experience. (S)
>
> I can confidently say that what we have covered I _know_, and, most important, I will not forget it. (S)

3. The seminars have been "metaphoric." They have served, at their best, to represent to the student more than they have "covered." Like metaphors, they have been at once _non_-cumulative and _instantly_ cumulative. It may be that as learning continues to explode, and significant knowledge and understanding become less attainable in 16 1/2 courses, we shall have, for the _sake_ of economy, to look increasingly to metaphoric ways of teaching.

> I have seen a large area in all its extent, or rather its extentlessness. I have seen how a man who writes clear and all-embracing books thinks and doubts. I have more questions than answers. The experience has been valuable because of what I have seen and met, the ideas that I have encountered, rather than what I have fenced off and mastered. (S)
>
> I would not assert that I had a _right_ to "valuable faculty time." Rather I would say that the faculty time put into my seminar educated me more per hour than any other faculty time I have been exposed to. (S)
>
> For a long while Western man has proceeded on the consumer assumption of learning. Ever since Bacon observed that "reading maketh a full man," the tendency has been to fill in the various departments of knowledge for each student. The common images are "coverage" or "survey" or "course." In fact, what we have had in mind is a sort of guided tour of knowledge with the

stress on "appreciation" and on consumer values generally. But a century ago with Cézanne and Baudelaire the arts suddenly shifted stress from consumer to producer values. The audience was cast in the role of co-creator. What is called non-representational or abstract or symbolist art is merely a form of do-it-yourself kit which calls for much participation in the art process on the part of the spectator. Diaologue or participation had returned to the arts. ... However, since Cézanne, education has persisted in its industrially oriented task of homogenizing and processing the heterogeneous urban masses, rather than with casting the learner in the role of explorer and discoverer. It is only very recently that there has come the general wish to return to dialogue and to avoid the mere briefing session or lecture. For a great while we had accepted the teacher as center and the learner as margin. Now we have come to recognize that both teacher and student are centers in interaction, or in a dialogue, and that learning is a perpetual process of discovery for both. Everybody has had the experience in dialogue of discovering that any subject matter whatever, when handled in depth, strikes the central spring of the unity of knowledge. Our receding visual culture had never sought this kind of unity so characteristic of the dialogue. Yet our educational institutions still embody that visual culture with its complete indifference to the interplay of the various kinds of knowledge. Perhaps what I'm saying is not only that we are now moving into a dialogue or participational form of culture, but that dialogue form, as compared with the old visual survey, is not only a depth program but a crash program. It not only goes deeper, it goes faster. (Marshall McLuhan, "A Fresh Perspective on Dialogue")

VII CONCLUSION

Based primarily on your experience in your particular seminar, but also on your impressions of the seminars generally, would you be inclined to recommend participation in a seminar to a member of next year's freshman class?

2.4%	chances are that I would not
16.8%	there is a chance that I would, but quite likely with some serious reservations
80.8%	chances are that I would

If one can thus persuade the student to trust his creative powers, and to see early the relationships between what he reads and his own and society's values, he acquires reasons for paying attention to the modes of thought of various areas of knowledge and learns in a way which is permanently meaningful rather than exam-oriented. (F)

It was my first satisfying learning experience. Always fulfilling in even my blackest moments (and I have had a rather common freshman year), it has never let me forget that joy of learning which is basic to university life. As a rewarding intellectual and personal experience, it is my measure of other courses -- demanding more in them, I now find more. It is the best part of my freshman year. (S)

The freshman seminar program has the overwhelming support and respect of the Harvard student body. (from the report of the Freshman Affairs Committee of the Harvard Council for Undergraduate Affairs)

The seminar program has offered in four years two or three seminars that were shamefully bad and eight or ten more that were mildly regrettable. There have been special difficulties in the natural sciences, and almost none of the seminars, regardless of area, has been wholly immune to the problems we have discussed. Its impact, nonetheless, obliges us to conclude that the program in its conception was remarkably right and in its results has been remarkably successful.

It is as one student noted "an idealistic institution, curiously committed to reality" -- to the real importance, as represented by the university, of learning, of self-knowledge, of intellectual awareness and honesty. The university as a whole defines its ideals and provides its context; it is derivative and dependent. But it has exploited the university, for the purpose of education, by and large demonstrably well.

APPENDIX I

A. SOURCES OF STATISTICAL DATA

1. faculty reports on 574 of the 810 students enrolled in seminars '59-'62
2. admissions data on background and early 'promise' of all members of seminars and of the control group
3. Registrars' records of concentration decisions and of grades: all members of seminars and of the control group
4. departmental reports of performance in graded tutorial
5. Dean's Office records of Administrative Board action leading to withdrawal from college
6. 690 questionnaires completed by seminar members at the close of their freshman year (an 85.2% response)
7. 468 questionnaires completed by seminar graduates in November '62 (a 64.5% response from students still at Harvard or Radcliffe) -- Of the total group, 79 seminar students, or 9.8%, responded to neither questionnaire
8. 472 questionnaires completed in November '62 by members of a 'control group' whose PRL's[1], expected areas of concentration, and school background matched those of the seminar students (a 64.4% response from students still at Harvard or Radcliffe)

B. 79 SEMINAR GRADUATES WHO RESPONDED TO NEITHER QUESTIONNAIRE

1. 26 are (or would be) in the class of '63, 33 in '64, 20 in '65.
2. 24 have left college and not returned
3. 23, or 29.1% were in non-credit seminars (15.1% of the total group were in non-credit seminars)
4. 40.0% were thought by their seminar leaders to have profited unusually little from their seminar, 18.2% to have profited unusually much (in the total group: 22.9%, 33.0%)
5. 48.5% of those in the college last June (Harvard only) were in the top half of their class, 51.5% in the bottom (in the total group: 61.9%, 38.1%)

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[1] Radcliffe does not use PRL -- Radcliffe control group was therefore matched on the basis of verbal aptitude scores (SAT)

C. VALIDITY OF CONTROL

1. for non-questionnaire data (i.e. all seminar graduates and all members of control group)

   a. PRL

	1.__	2.__	3.__	4.__
seminar	2.0%	44.8	45.7	7.5
control	1.4	46.1	44.6	7.9

   b. expected area of concentration

(absolute match)

   c. school background[1]

	public	private
seminar	59.4%	40.6
control	61.4	38.6

2. for data from Questionnaire 2, sent this fall to seminar graduates and control group (comparability of respondents)

   a. PRL

	1.__	2.__	3.__	4.__
seminar	2.1%	49.6	42.3	6.0
control	1.5	54.2	38.6	5.7

   b. expected area of concentration

	A	B	C
seminar	39.4%	32.9	27.7
control	44.1	28.5	27.4

   c. school background

	public	private
seminar	61.3%	38.7
control	65.2	34.8

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[1] in selecting control group, similarity of school background was sacrificed, where necessary, in favor of similarity of PRL and expected area

FRESHMAN SEMINARS 1959-63

PROFESSOR WILLIAM ALFRED will lead an informal seminar in dramatic literature and writing for eight to ten freshmen.

The work of the group will center in informal weekly discussion rather than in any kind of group research. Students will write an essay a week about the plays or books discussed, and will meet individually with Professor Alfred for discussion of their work. Weekly meetings will be supplemented by informal dinners, lectures, and discussions with members of the faculty and other guests.

Participants will be exempted from the General Education A requirement.

Professor Alfred is interested in locating for this seminar freshmen who have evidenced in earlier work both literary sensitivity and a keen interest in writing.

throughout the year
full-course credit

DR. MARY JANE ASCHNER will collaborate with a seminar group in an exploration of the bases upon which human beings make judgments and reach decisions.

Some of the following questions will be considered: Where do our various codes or standards of judgment come from? Upon what bases do individuals and groups govern their choices, their decisions to act? What leads, persuades or compels an individual to accept or reject an idea, to change his mind, to adopt a plan of action? How do standards and codes of judgment differ from one field of human enterprise to another, from one time in history to another, from one society or culture to another? How do standards change? Are there some standards or criteria of judgment which have withstood the test of time and cultural change?

The work of the seminar will be based on common readings, chiefly in psychology, philosophy, and anthropology. Participants will also pursue, independently, related investigations, and will contribute to the common inquiry formal and informal reports on their findings.

The seminar will welcome applicants with diverse interests. There are no formal prerequisites.

throughout the year
full-course credit

DR. FRANCIS X. BARRON will lead a consideration of psychological aspects of the problem of war and peace in a nuclear age, with special emphasis on problems of disarmament. Topics for discussion will include: the basic nature of aggression, neurotic fear and anxiety, moral urges and responses, the military in society, nuclear weapons and the popular imagery of nuclear warfare, the search for meaningful disarmament programs, the need for creative action and imagination in international relations. The seminar will meet regularly once a week, with open meetings and specially qualified guest lecturers once a month.

spring term
half-course credit

PROFESSOR W. J. BATE will conduct a tutorial program for two to three freshmen with exceptional ability and interest in English literature.

In its informal meetings and in individual conferences the group will examine a large number of works, primarily within a historical context. Discussion of those works will probably be supplemented by the writing and discussion of critical papers.

Selection of students will be based primarily on literary aptitude, intellectual maturity, and liveliness of interest evidenced in previous work and in interviews with Professor Bate during registration week.

throughout the year
full-course credit

THE BIOLOGY DEPARTMENT will offer opportunities for a small number of students to undertake independent and individual work in experimental biology under the guidance of several members of the staff. Some prior laboratory experience is necessary, but this need not have been gained in formal courses; previous work in biology is desirable but not required.

This is a non-credit program; for this reason a student considering entering it is urged to take his over-all academic program into account.

throughout the year
no credit

DR. LEON BRAMSON will direct a group of five freshmen in study bearing on the immigrant community in the large American city.

The students will be introduced to the methods and problems of social observation through field work in the north end of Boston. After familiarizing themselves with the special character of the area, they will go on to study a variety of materials in sociology, history, and other disciplines relating to their individual interests.

The group will meet weekly and Dr. Bramson will also consult with members individually. Those students will be particularly eligible who, because of their social or regional milieux, have had little or no contact with the life of immigrants in cities, and for whom this work would constitute a break with previous experience.

throughout the year
full-course credit

DR. ALFRED BRENNER will conduct a seminar in modern physics. General reading and informal discussion will be concerned with the experimental basis for our understanding of elementary particles. Topics will include aspects of atomic and nuclear physics, relativistic kinematics, and methods and instruments of contemporary research including accelerators, particle counters and detectors, and techniques of data analysis.

Participants will be selected primarily on the basis of proven interest and ability in the quantitative sciences. Proficiency of the student in mathematics or science courses taken during the fall semester, as well as the level of those courses, will be taken into consideration. However, no detailed knowledge of the particular subject matter of the seminar will be required for admission.

spring term
half-course credit

PROFESSOR JEROME BRUNER, with the assistance of DR. ELIOT ARONSON, will direct an investigation by ten to twelve freshmen into selected topics in the behavioral sciences.

Weekly seminars, library research, field studies, and laboratory experiments will serve as a basis for discussions as well as for reports and papers by the members of the group.

Participants will be selected in February from among those students in Social Relations 10 who evidence in the fall term a genuine interest and competence in work of this kind.

spring term
half-course credit

PROFESSOR McGEORGE BUNDY will direct a group of ten to twelve freshmen in studies of the relation between domestic politics and foreign policy in selected historical instances, both in American history and in the history of other countries.

The work of the seminar will consist in study, discussion, and essays on such cases, and particular studies may be related both to the work of other courses and to the individual interests of students. It is hoped that a wide range of historical materials may be held in focus by a continuing concern for present-day American problems.

Selection of students will be made by Mr. Bundy on the basis of liveliness of interest and background in historical study.

throughout the year
half-course credit

DR. MARY I. BUNTING will supervise a seminar in microbial genetics. Students will participate in experimental studies related to basic research on color inheritance in Serratia marcescens, an easily cultivated bright-red bacterium that is particularly useful in the investigation of genetic mechanisms.

Each student will begin work with an untested strain of Serratia and participate through that work in a cooperative survey of patterns of color variability. Preliminary studies indicate that characteristic but widely different patterns of variability may be found and that these patterns are remarkably stable. The survey will include observation of spontaneous and induced mutations and also of culturally induced color-phase variations.

As individual students gain experience, and develop interests and realistic plans for exploring unexamined aspects of the general problem, they will be encouraged to undertake investigations of their own design. The primary concern of these investigations will be to increase our understanding of the genetic, biochemical and/or physiological mechanisms that are responsible for the observed variations.

The laboratory techniques required for useful participation in the survey are easily mastered, but the phenomena to be sudied are complex and related to much active current research. Considerable reading of primary and secondary sources will be essential to an appreciation of the basic concepts involved.

There are no prerequisites.

throughout the year
full-course credit

PROFESSORS FRANK M. CARPENTER and EDWARD O. WILSON will supervise studies by qualified freshmen in the classification of insects, their behavior, and their responses to environment.

Arrangements will be informal and planned according to the individual student's interests. Academic credit for this work may be granted, where appropriate, by approval of the supervisor. Applicants need not previously have done formal work in biology; they should, however, be seriously interested in studying insects.

throughout the year

PROFESSOR BRUCE CHALMERS will conduct a seminar in physical metallurgy.

The seminar is arranged to permit a few selected students to participate actively in the research activities of the Physical Metallurgy group. Each member will be assigned an experimental project which, while limited in extent, is planned to provide new information on some aspect of the structure or the behavior of metals.

In order that the experimental work can be effective, it is necessary that the students shall acquire some understanding of the present state of knowledge and of the problems that remain unsolved in the area of their project. To achieve this, the students will meet with faculty members on a regular basis for informal lectures and discussion; in addition, advice and help will be available in the laboratory. The detailed schedule will be worked out in consultation with the participants.

Since the seminar projects will be selected from the topics that are of particular interest when the seminar begins, it is not possible to specify now exactly what they will be. Previous participants have worked on the measurement of the purity of metals, on the growth of crystals of metals and alloys, and on the preparation of a film showing how ice crystals grow in supercooled water.

fall term or throughout the year
half- or full-course credit

MR. ROBERT CHAPMAN will conduct for eight to ten freshmen who are particularly interested in the theater a seminar in the study of dramatic texts and their historical backgrounds, with specific relation to stage interpretation and development of imagination, style, and movement. Previous experience is not required.

The group work will consist of two two-hour meetings each week, concentrating on diction and the study of styles in particular relation to selected texts. These weekly meetings will be supplemented by and correlated with a required program of movement for the theater, a specially adapted form of physical training.

From time to time individual conferences will be held. Applicants should be prepared to present at their audition a short speech from a play of their choice.

throughout the year
full-course credit

PROFESSOR FREDERICK DEKNATEL will conduct a seminar on the history of art.

The seminar will study forms of painting and sculpture in a limited number of outstanding examples chosen from two very different periods of European art. The primary aim will be the determination of meaning by analysis and comparison of the works themselves. Readings in critical and historical writing will be used to discover the significance of the primary findings. By concentrating on specific problems of interpretation members of the seminar will be introduced to some of the methods of the history of art. Consideration of works in widely separated periods should give a conception of the scope and possibilities of the field.

Membership will be limited to eight or ten students selected on the basis of evidence of interest in, or experience with, works of art. Ability to read French or German will be an advantage but is not a requirement for admission to the seminar. Written and oral reports by the students will serve as a basis for the seminar's discussions.

fall term
half-course credit (area C)

PROFESSOR RAPHAEL DEMOS will work with two groups of five freshmen each in a philosophy tutorial. It is not required that the students be members of his basic course; they must, however, have a serious interest in philosophy.

The groups will meet bi-weekly for discussion in some depth of various philosophers, both classical and contemporary. No credit and no grades will be given for this tutorial, the expectation being that students enjoy engaging in Socratic discussion of philosophical matters.

throughout the year
no credit

DR. WILLIAM H. DRURY, JR. will conduct a seminar on field biology at Drumlin Farm in South Lincoln, Massachusetts (10 miles from Cambridge and accessible by public transportation). The seminar will take the form of individual study of the adaptations of a specific species of animal or plant to its environment.

Animal studies will focus upon observations of marked individuals to analyse a) the relative numbers and survival or movements of different age groups of local birds or mammals, b) the behavior patterns by which they find food, communicate with others of their species, or carry through the cycle of pairing, nesting and raising young.

Plant studies may concentrate on an individual species or group of plants, studying a) the effects of soil, land use and details of local habitat, or b) areal distribution according to topography.

Each student will be expected, under supervision, to search in the literature for what is already published on his topic, to gather observational and experimental evidence directly from the organisms in their local habitat, and to describe his results in an analytical and interpretive report.

Participants will be expected to spend at least the equivalent of one full day a week on this course. Those who already have some knowledge of natural history will benefit most.

throughout the year
full-course credit

PROFESSOR CORA DU BOIS will conduct a seminar on India and its relations with the modern West.

For over three thousand years Hinduism has maintained itself despite repeated foreign incursions. Today India's westernized leadership is trying to create a modern, democratic welfare state out of this traditional system of society and of values. It will be the purpose of the seminar to examine what happens when two such sets of values meet. In what respects are the ethics and the institutions of these two life ways compatible; in what ways may conflicts between them be resolved; are there any irreconcilable contradictions? What do we know about the social and psychological processes involved in such an encounter, and how may we study them further?

throughout the year
full-course credit

PROFESSOR ERIK ERIKSON will conduct a seminar for ten freshmen on the stages of human development and related problems of ethics. The seminar will review the strengths and vulnerabilities intrinsic to each stage of life and those basic obligations of the social order which have evolved as safeguards of human development. Selected life histories will be viewed in relation to the historical crises of their times.

spring term
half-course credit

PROFESSOR FRANKLIN L. FORD will conduct a study group in German history, focusing on recent developments in German historical thought as evidenced in post-1945 periodical literature.

Members of the group will be expected to enroll in History 150b to gain background for their work in the seminar, and weekly meetings with Professor Ford, the teaching fellows, and invited guests will serve to guide the group's research activities and augment the formal work of the course.

Candidates for the seminar will be required to demonstrate a thorough command of German; beyond this, selection will be based on liveliness of interest and competence in the general field of history, as well as on recommendations of faculty members in the History and German departments who are associated in the fall term with students interested in German history or literature.

spring term
half-course credit

PROFESSOR JOACHIM GAEHDE will offer a seminar on problems in the history of art to eight or ten interested and able freshmen who will be invited to join on the basis of their performance in the first term of Fine Arts 13. Library research and the study of original works of art will serve as a basis for discussions as well as for reports and papers. The group will meet for about two hours weekly.

spring term
half-course credit

MR. LESLIE A. GARAY will offer a seminar in the Principles of Plant Evolution, with special reference to the orchids.

The orchids constitute the largest and most complex of plant families and offer a unique opportunity for students to trace and investigate the various evolutionary processes responsible for the striking diversity found in today's species. Among other topics, the student may investigate morphological and ecological adaptation, geographical distribution, pollinating mechanisms and speciation in the orchids.

There will be a short paper required on some aspect of orchid evolution, to be chosen by the student for his special attention. Reading and laboratory work will supplem[illegible] weekly meeting. The seminar will use the facilities of the unique and [illegible]ections of the Orchid Herbarium and Library of Oakes Ames in the Botan[illegible].

Prerequisite: [illegible]hool course in biology. Applicants may find it instructive to [illegible]nsky, "The Genetic Basis of Evolution," Scientific American, Januar[illegible]well, "Darwin's Missing Evidence," Scientific American, March 19[illegible]nt, "The Fertilization of Flowers," Scientific American, June 1951.

fall term
half-course credit

PROFESSOR STEPHEN GILMAN will offer for ten or twelve freshmen a seminar on comic literature connected with Humanities 7, "Uses of the Comic Spirit."

Informal weekly discussions will serve as a forum and provide direction for the students' work in areas suggested by the outline of the course. The aim of the seminar will be to create an opportunity for intelligent independent study of literature—no attempt will be made to engage the group in organized research.

Members of the group will be drawn from Humanities 7, largely by invitation.

spring term
half-course credit

DR. GEORGE GOETHALS will direct a seminar investigation by five to ten freshmen into the history and philosophical implications of the behavioral sciences. Their study will focus primarily on three considerations:

1. the historical background of man's attempt to understand personality development and human behavior;
2. the development and evolution of the science of human behavior; and
3. the implications of existing knowledge in this field.

The criteria for selection of students will be primarily maturity, aptitude, and interest rather than academic background. Individual interests of members of the group might embrace a wide area, including sociology, psychology, anthropology, history, philosophy, or psychoanalytic theory.

throughout the year
full-course credit

MR. WILLIAM GORDON will direct an investigation of creative process as it is exemplified in science and technology.

The creative solution of problems, whether in science or in art or diplomacy or business, may usefully employ certain techniques and attitudes that have to do with unconventional ways of seeing and of thinking. It will be the purpose of the seminar to provide training in those techniques.

The work of the seminar will center in analysis of actual problems in the exact sciences and in practical investigation of inventive solutions.

The work of the group will be enhanced by variety of interests and perspectives and by good secondary school background in science.

Applicants will find it instructive to read before the opening of college Gordon, William J. J., Synectics—The Development of Creative Capacity, New York, Harper and Brothers, 1961.

fall term; repeated spring term
half-course credit

MR. JOSEPH GRANNIS will conduct a seminar to consider the purposes of the curriculum of the American schools. The Progressive Education movement will be examined in its historical context, and will be compared with the movement in the U.S.S.R. today to "make the school closer to life." The seminar will then try to appraise the relevance of Progressive Education to current developments in the American schools, to ask if the questions it raised for earlier generations are now settled or obsolete, or still crucial. This may lead to the seminar's constructing a model curriculum of its own or exploring some problem in an actual school setting.

A central aim of the course will be to introduce the students to the resources and constraints of scholarship—especially history and philosophy—for the definition of educational policies and issues. The students will present papers for discussion of their individual research and analysis, as well as discuss various readings pursued in common.

throughout the year
full-course credit

PROFESSOR DONALD GRIFFIN, DR. ROBERT BARTH, and DR. JEAN HARRISON will conduct a seminar on communication and "language" in animals.

The seminar will begin with demonstrations and experiments devoted to the dances that serve for communication among bees. This work will require two afternoon or week-end field trips, early in the term, to the Massachusetts

Audubon Society Field Station at Lincoln, Massachusetts. After this firsthand introduction to a classic example of the experimental analysis of animal behavior, the balance of the term will be devoted to weekly meetings at which students will present short papers prepared from selected readings in this and other aspects of animal behavior.

Academic credit for this work may be granted, where appropriate, by approval of Professor Griffin.

Freshmen interested in this seminar should read during the summer Karl von Frisch's Bees, Their Vision, Chemical Senses, and Language, Cornell University Press (paperback), 1956.

fall term

PROFESSOR ALBERT GUERARD will conduct a seminar on Modes of Subjective Experience. The group will approach writing (both imaginative and expository) and reading as intimately related and highly personal acts. It will be the assumption of this seminar that the best writing occurs when a person comes to terms with himself and his experience and discovers his own voice and own imaginative or temperamental bias. Participants will practice various forms of writing throughout the year, the proportion of imaginative or expository work depending upon the instructor's sense of the students' needs.

Seminar members will be expected to enroll concurrently, for the fall term, in Comparative Literature 166, where they will read a number of novels concerned with crisis and self-discovery. In the spring they will read and analyze further examples of highly personal communication: lyric poems from the Elizabethans to the present, autobiographies, further subjective novels, etc.. The aim, generally, will be to study the relationship between personality, subject matter, and authorial voice.

The members of this seminar will be exempted from the General Education A requirement.

Applicants may submit, if they wish, a typewritten sample of their writing, either expository or imaginative.

throughout the year
half-course credit

DR. DAVID GUTMANN will conduct a seminar in psychology which will focus on the relationships between personality and social environment. Special attention will be paid to those personality systems, involving the perception, communication, and integration of individual experience, which most directly paraphrase the configuration of society. Thus individual personality will be examined as a motivated rephrasing of social forms.

The seminar will employ a variety of sources: readings in the area of personality and culture, literature which communicates the sense of exotic experience, and discussion with invited faculty and foreign students. Participants will be encouraged to explore sub-cultures in the Boston area;

reports on field work and on other independent studies will supplement the seminar's readings and discussion.

Though students considering further work in the behavioral sciences are preferred, other interested students are invited to apply.

throughout the year
full-course credit

PROFESSOR OSCAR HANDLIN will direct a program of reading and research for six to eight freshmen seriously interested in American history.

As contributors to his investigation into the history of liberty in the United States, the students will examine an integrated series of topics on a comparative basis in a variety of different societies. Different members of the group will probably deal with different topics, but their work will converge on the history of liberty as a central theme. Frequent discussions with Professor Handlin, and possibly auditing of courses or seminars, will provide background and perspective for the group's research.

Candidates for the seminar will be judged on the basis of intellectual qualifications, genuine interest in the proposed research, and basic familiarity with American history.

throughout the year
full-course credit

PROFESSOR SEYMOUR HARRIS will conduct a seminar on economic policy for ten to twenty students. The work of the seminar will center in a substantial paper by each student on some independent research in original sources. Weekly meetings of the group will provide a forum for discussion of members' research and of supplementary, more general topics. Meetings will begin with lunch, at which colleagues and other guests will be present for informal discussion with members of the seminar. Concurrent enrollment in Economics 1 is recommended but not required.

Applicants for this seminar are asked to explain in a one-page paper their reasons for seeking enrollment.

throughout the year
half-course credit

PROFESSOR JAMES HEALY will conduct a seminar on the nature of labor-management relationships in the United States and the impact of unions in American society. The development and characteristics of the American labor movement will be considered, as well as the conduct of collective bargaining as it affects the individual employee, the firm and the public interest.

Although the seminar will rely in part on extensive readings and case-studies in labor history, human relations, industrial relations, and government policy, at least half of the work of the seminar will provide direct exposure to and involvement in labor-management institutional relationships. Students will meet with company and union representatives to study selected problems. They will participate in one or more actual arbitrations of labor disputes and will be expected to analyze the issues and render decisions. They will engage in the collective bargaining process. The purpose of the seminar is to develop through reading, discussion and firsthand experience a better understanding of a significant and controversial subject.

spring term
half-course credit

THE HISTORY DEPARTMENT

I. . . . will offer a challenging program to a limited number of freshmen with special interest and aptitude in history. Members of the Department listed below will conduct seminars in several specific fields of history. The program is under the general administration of PROFESSOR FRANK FREIDEL.

ASST. PROF. DANIEL CALHOUN
DR. PHILIP DAWSON III
DR. STANLEY KATZ
DR. MARK MANCALL
(*)

The seminars, which will meet in groups of not more than six, will make intensive examinations of original documents in an effort to understand the nature of historical sources and the historian's processes of interpreting them and using them for historical reconstruction. The seminar work proceeding from study of the documents will broaden to include reading and discussion of related materials bearing on both the content and method of historical investigation. Papers will be required.

throughout the year
full-course credit

PROFESSOR DANIEL CALHOUN will lead a study of social agitation in American history, giving special attention to its religious aspects. During the fall term the group will examine the structure of the problem, ranging from protest movements of the 17th century to pacifist and racial protest in the 20th century, and will also be introduced to historical techniques. The work of the spring term will center on independent study of abolitionism and related topics.

Students entering the seminar should have a strong background in either American or European history.

DR. PHILIP DAWSON III will conduct a seminar on the history of France in the 18th and 19th centuries.

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*and in previous years Dr. Milton Berman, Dr. Elizabeth Brown, Dr. Akira Iriye

First topic: the insurrection in Paris in June, 1848, for which the sources will be the evidence given to and the report by the parliamentary committee that investigated the insurrection and, secondarily, other official documents and memoirs of contemporaries. This topic will exemplify some of the problems and techniques of writing a historical narrative.

Second topic: aspects of the life of Clemenceau, for which the sources will be selected speeches and writings by him. This topic will exemplify some of the features of intellectual history and of biography.

Third topic: the politics of a provincial town in 1789, for which the sources will be the lists of grievances drawn up by the voters in that town and, secondarily, other official documents, political pamphlets, and memoirs. This topic will exemplify some of the problems and techniques of analyzing the structure of a community in the past.

Writings by historians will be used to help interpret the documents. The ability to read French with the aid of a dictionary will be needed by participants in this seminar.

DR. STANLEY KATZ will lead an inquiry into the history of England and America in the 18th century.

The seminar will consider three problems during the course of the year: the Salem witch trials of 1692, the Stamp Act of 1765, and the American Revolution. The study of the witch trials, which will serve as an introduction to historical research, will enable students to read the testimony given by the witches, contemporary literature about the trials, and materials concerning law and society in Massachusetts Bay in order to arrive at a personal understanding of what happened in Salem. Written work will include essays on political and legal subjects, narrative reconstructions of the actual trials, and biographies of individual witches.

The Stamp Act will be approached through an intensive study of legislative documents and contemporary newspapers in order to show how an apparently simple measure of taxation appeared to be one thing in America and another in Great Britain. Individual research projects, oral and written reports, will be in English history (e.g., parliamentary politics in the repeal of the Act) or in American history (e.g., the New York and Boston Stamp Act riots). Finally, the seminar will attempt to dispel some of the myth surrounding the American Revolution. Students will use biographical techniques to explore the personalities and motivations of Loyalist and Patriot leaders and of the principal British politicians and administrators.

DR. MARK MANCALL will conduct an inquiry into various aspects of Chinese and Japanese history, traditional and modern.

The variety, uses and problems of working with East Asian historical documents will be examined through the study of five specific problems in

Far Eastern history:

1. family life in pre-modern (traditional) China: The seminar will approach the study of Chinese social history through the reading and analysis of a traditional Chinese novel, Ching-p'ing-mei.

2. The nature of the pre-modern Chinese and Japanese states: . . . analysis of the Chinese and Japanese historical record, emphasizing the traditional historian's view of his own society.

3. China's view of the West: The changing patterns of intellectual attitudes will be examined through analysis of the writings of the 19th century Chinese officials and of 20th century Chinese leaders such as Sun Yat-sen, Chiang Kai-shek, Hu Shih, and Mao Tse-tung.

4. The Marco Polo Bridge Incident (July, 1937): The seminar will examine both Chinese and Japanese official accounts and attempt to reconstruct the facts.

5. The United States-Japan Peace Treaty: . . . an inquiry into the problems of placing a specific document in his historical setting.

No prior acquaintance with Far Eastern history or languages is presupposed.

II. The History Department also offers the following seminars directed by PROFESSOR A. G. JAMESON:

A seminar on historical geography. Problems and topics for discussion and research will be drawn from the history of the development of Western Civilization (from c. 300 A.D. to the present). The aim of the seminar will be to examine the relationship between history and geography by analyzing the geographical factors in the economic, social, and political history of Western Europe. That analysis will be based on the principles of human geography, i.e. on the interconnection between the physical setting and the changing effects of human activity.

Problems to be studied will be taken from the following general topics: the geography of communications in Great Britain from the Roman roads to the railroads; the changing rural landscape of France; the urbanization of Germany; and the development of the modern state from feudal province to nation.

There will be bi-weekly meetings, papers, and reports. In the spring term each student will select a problem for more extensive treatment.

throughout the year
full-course credit

A seminar on the geography, history and ethnography of East and Northeast Africa. The seminar will consider the area from the Nile to the Zambezi, including the Sudan, Ethiopia, Somalia, Uganda, Kenya, Tanganyika, Zanzibar, Mozambique, and the Malagasy Republic.

Students will undertake extensive reading in both primary and secondary sources. The history of the various areas will be considered in terms of the available material: for the ancient Sudan and medieval Ethiopia in terms of the cultural topography; for the coastal areas in terms of the Portuguese, Dutch, French and English literature of travel and discovery; for the central lake region in terms of the literature of exploration, etc. Topics will include: Ancient and Medieval Northeast Africa; the Arab Colonies; the Portuguese Conquest; Explorers and Missionaries; the Slave Trade and the Abolition Movement; the Chartered Companies; the Great Scramble; and the Liberation Movements.

In the spring term each student will be assigned a tribe from one of the major East African peoples—Nilotes, Galla, Somali, Bantu—for extensive treatment.

Students will be expected to acquire a detailed geographical knowledge through the use of cartographic tools. There will be bi-weekly meetings, papers, and reports.

throughout the year
full-course credit

A seminar on the geography, history and ethnography of West Africa. The seminar will consider the area from the Senegal to the Niger, and will include the territories of former British and French West Africa embracing the coastal states of Mauretania, Senegal, Gambia, Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Dahomey, Nigeria and the interior Soudanese states of Mali, Upper Volta, Niger.

Students will undertake extensive reading in both primary and secondary sources. The physical, cultural and human geography will be considered. The history of the coastal rain-forest districts (Grain, Ivory, Gold and Slave Coasts) and the savanna and semi-desert and desert areas will be examined in terms of the cultural topography and the literature of discovery, exploration, trade and travel. Topics will include: the medieval Soudanic "Empires" (Ghana, Sosso, Mali, Songhai, Bornu, Hausa) and the Islamic Invasions; the Fulani Conquest and the Muslim Emirates; the Portuguese Explorations and the beginnings of European interests in West Africa; the Chartered Companies and the English, French and Dutch colonies in the 17th and 18th centuries; the Slave Trade and the Abolition Movement; Explorers and Missionaries; the European Colonial Scramble in the 19th century; West Africa under European rule; and the Liberation Movements.

In the spring term the ethnographic composition of West Africa will be examined, and each student will be assigned one of the major peoples—Ashanti, Bambara, Ewe, Fulani, Hausa, Ibo, Malinke, Mossi, Tiv, Wolof, Yoruba—for extensive treatment.

Students will be expected to acquire a detailed geographical knowledge through the use of cartographic tools. There will be bi-weekly meetings, papers, and reports.

throughout the year
full-course credit

PROFESSOR HANS HOFMANN will direct a philosophical and psychological study of religious and secular cultural trends which contribute to the formation of individual and corporate values. On this basis the problem of meaning and purpose in human existence will be discussed.

The group will meet weekly for discussion of pertinent texts and studies. Applicants for this seminar are asked to submit a one-page paper explaining their reasons for seeking enrollment and indicating their background in the general area of the humanities.
throughout the year
full-course credit

MR. GEORGE HUXLEY will conduct a seminar on Herodotus.

An acquaintance with the Greek language, or the intention to begin learning it, will be an advantage. But the seminar will not be restricted to prospective students of ancient history and literature. Some essays will be required; they will be read and discussed at the seminar. The object will be to illustrate problems in source criticism and to examine the reliability of Herodotus in the light of historical, literary, and archaeological evidence.
fall term
half-course credit

PROFESSOR COLUMBUS ISELIN will conduct a seminar on oceanography.
spring term
half-course credit

PROFESSOR WILLIAM KLEMPERER will conduct a seminar to consider selected papers from the current literature in the field of chemistry. Applicants should have a strong secondary school background in both chemistry and mathematics.
spring term
half-course credit

PROFESSOR CLYDE KLUCKHOHN will work with three to five freshmen in a research project on the Navajo Indian.

There is a variety of material concerning the Navajo that has not been adequately explored: nineteenth-century government reports, books and papers of travelers and soldiers, medical and biological data, and archaeological studies. Though the students may therefore undertake work with different kinds of materials their work will converge on the same general topic, possibly resulting in a published report.

Though students will not be required to enroll in Anthropology 1 or 10, they will be expected to do considerable independent reading in this field under Professor Kluckhohn's guidance. Enrollment in Social Sciences 4 may prove for some a useful adjunct to the activities of the worksho Frequent seminars will further supplement the students' research activities.

Members of the group will be selected by Professor Kluckhohn on the basis of general aptitude, intellectual maturity, and liveliness of interest, rather than of precocity in a particular field. Not all will intend to major in anthropology: equal consideration will be given students with a genuine interest in history, social relations, human biology, or archaeology.

throughout the year
full-course credit

PROFESSOR HELMUT KOESTER will conduct for students interested in the study of religion a seminar on the history of early Christianity and the modern interpretation of its sources.

The work of the seminar will be based on reading of the New Testament, of related Jewish and Christian sources of the first two Christian centuries, and of other sources recently discovered in Palestine and Egypt.

Discussion will focus on the problem of interpretation. In their research, reports and seminar papers the students will investigate various methods of interpretation developed in the last hundred years: the literary criticism school, the philological historical method, the history-of-religions approach, and modern hermeneutical discussion.

Although knowledge of German or Greek would be useful, there are no academic prerequisites for this seminar.

fall term
half-course credit

PROFESSOR SANFORD LAKOFF will direct a seminar on the making of the American Constitution. The members of the group will examine the records of the Constitutional Convention, the life and thought of a number of the Founding Fathers, the arguments advanced in the *Federalist* papers, and, finally, later interpretations of the origin and development of American Government.

Applicants will be expected to have read before coming to college Carl L. Becker, *The Declaration of Independence* (Vintage paperback) and Max Farrand, *The Framing of the American Constitution* (Yale paperback).

throughout the year
full-course credit

DR. I. MACKENZIE LAMB will conduct a seminar on "seaweeds," scientifically known as marine algae. This may be of interest to freshmen considering working towards a career in oceanography or marine biology.

The greater part of the work of the seminar will consist of week-end field-trips to the shore (mainly Cape Ann, about 35 miles north of Boston), where Dr. Lamb and his research assistants are conducting transplantation experiments and a survey of the seasonal succession of marine algal vegetation and growth-rate, using SCUBA diving techniques. (Training in SCUBA diving will not be necessary for the participants, but for those who are interested in learning this skill as a tool for marine studies the Harvard Diving Club offers approved courses.) Field recognition of the commoner larger marine algae will be taught on these field trips, while the more theoretical aspects of algology will be covered by occasional meetings in the laboratory of the Farlow Herbarium where details of morphology, anatomy, classification, reproduction, etc. will be discussed with the aid of color slides and microscopic preparations.

Freshmen taking part in the program will be expected to provide between them, on each field trip, their own automobile transportation and expenses.

An active interest in biology in general, and in marine life in particular, is the only prerequisite for this seminar.

throughout the year
normally no credit

PROFESSOR BILLY [illegible]ON will conduct a seminar in music.

Through performance, analysis, discussion, and written imitation of a number of compositions from several historical periods of Western music, the members of the seminar will confront some of the basic questions of musical form and style. Rhythm, meter, melody, harmony, counterpoint, sound medium and color—all aspects of musical structure will be considered.

Participants should have a basic proficiency on some musical instrument and enough piano technique to read at sight simple four-part hymn settings. The seminar may not normally be counted toward the requirements for concentration in music.

throughout the year
full-course credit

DR. DOROTHY LEE will direct a seminar investigation into the relationship between the individual and society.

The concept of culture will be examined through intensive study of several primitive societies. Conclusions drawn from that study will be used with readings in philosophy, American literature, and the behavioral sciences as a basis for analysis of American culture. Individual study and reports will supplement common readings and discussion at each stage of the investigation.

fall term
half-course credit

DR. DOROTHY LEE, DR. WILLIAM GAMSON, DR. RICHARD MANN, DR. PHILIP SLATER, and MISS SUSAN TAX will conduct five seminars which will deal with different aspects of the relationship between the individual and his society. Considerable study in each of the seminars will be directed toward an understanding of the unconscious, of human relations, and of the cultural factor in human experience and behavior. Beyond this the concerns of the five seminars will be shaped to a large extent by the interests and competences of the seminar leaders.

DR. LEE will direct a study of different cultures, including the American culture, with a view of investigating such aspects of the self as autonomy, commitment, alienation, meaning, and relatedness.

DR. GAMSON's seminar will devote particular attention to the determinants and nature of political behavior.

DR. MANN will bring to bear the seminar's common investigations on the problem of racial discrimination.

DR. SLATER's seminar will focus to a large extent on comparisons between the myths and rituals of contemporary American society and those of primitive cultures.

MISS TAX will be concerned with questions of human existence, and will draw on materials from the humanities as well as from anthropological sources.

In addition to the meetings each seminar will hold weekly, there will be each week a joint dinner meeting of the five seminars with speakers drawn from many different fields, including the sciences.

Although they will be interested to know of any special interests that applicants may have, final assignments to the different seminars will be made at the discretion of the seminar leaders. There are no special qualifications for these seminars.

throughout the year
full-course credit

DR. SHIRLEY LETWIN will conduct a seminar on David Hume and the British political tradition.

The object of the seminar will be to study Hume as the outstanding representative of a persistent British attitude toward politics. Hume's essays, and a few selections from other works, will be read closely in order to discover the categories that Hume considered relevant for politics and how he related politics to other human activities. Discussions will center on such questions as: Did Hume think a science of politics possible? Why did he insist that justice is both natural and artificial? What qualities did he require in a politician? Did he see a conflict between politics and morality? How is his view of politics related to his views on metaphysics and ethics? Additional materials will be introduced to help the seminar consider Hume in relation to the British political tradition. Readings will be few but intensive. Students will be asked to give short seminar papers.

spring term
half-course credit

PROFESSOR WILLIAM LILLER and other members of the Department of Astronomy will offer a seminar in astronomy and astrophysics.

The work of the seminar will be carried on at the Observatory in weekly discussions with prominent astronomers and astrophysicists from the Harvard faculty and the staff of the Smithsonian Astrophysical Observatory. There will be occasional lectures, also, by distinguished visiting scientists.

Participants will receive individual training in the use of astronomical instruments and will carry out one or two research programs, working either on their own or under the direction of members of the faculty.

Students who are enrolled in the seminar will be expected to participate also in the work of Astronomy 1, the basic course in this field. Their work in that course will constitute part of the requirements of the seminar; they will not enroll separately in Astronomy 1.

Interested students who show promise will be invited to participate in a program of research and study during the summer of 1963. Those students will receive a regular stipend for a ten-week period beginning late in June.

throughout the year
full-course credit

PROFESSOR M. STANLEY LIVINGSTON will conduct a seminar on the Cambridge Electron Accelerator and high-energy particle physics.

Topics discussed will include the elementary particles of nature and their interactions, basic concepts of particle physics, principles of high energy accelerators with emphasis on the 6-Bev Cambridge machine, properties of the high-energy radiations from the accelerator, research experiments under development by research scientists from Harvard and M.I.T., and other topics in which the students might have a special interest.

The seminar will be conducted as an informal discussion and will meet weekly in the CEA laboratory. Students will be assigned individual study projects on special topics, to be reported to and discussed by the group. Some experimental activities in assisting scientists engaged in research experiments can be arranged.

spring term
half-course credit

PROFESSOR KENNETH LYNN will conduct a seminar for seven or eight freshmen with exceptional ability and interest in American literature. In its informal meetings and in individual conferences the group will examine a large number of works, primarily within a historical context. Discussion of those works will be supplemented by the writing and discussion of critical papers Selection of students will be based primarily on literary aptitude, intellectual maturity, and liveliness of interest evidenced in previous work and in interviews with Professor Lynn during registration week.

fall term
half-course credit

MR. LOUIS LYONS will conduct a seminar exploration of major public issues as they arise in the news. The objective of the seminar will be to discover satisfactory ways of keeping informed about public affairs.

Discussions will consider the adequacy of the daily news reports, the availability of background sources, the characteristics of the press and other information media, and the problems involved in effectively using these media as basis for understanding of public affairs.

Each student will follow some current issue through the news and will report periodically on the issue and his experience in keeping up with it. Readings will be concerned partly with those issues and partly with the nature of the press and with problems in communication.

throughout the year
full-course credit

PROFESSOR DAVID McCLELLAND will direct a fall term seminar in social psychology, focusing on the people of Mexico as an example—their history (part Spanish and part Indian), their institutions and village and city life, their values and personality structure, their political, economic and artistic problems and possibilities. The seminar will concentrate on the study of personality and culture, on the Mexicans as a people rather than on Mexico as a political entity. Readings from a number of fields, including history, anthropology, psychology, and literature will provide a basis for the group's discussions and for individual papers

A reading knowledge of Spanish will be useful, but is not required.

fall term
half-course credit

PROFESSOR RICHARD MANN will conduct a seminar on leadership and friendship in small groups.

Everyone in a position of authority makes assumptions about the nature of those he is supposed to lead, teach, or govern. He may see them as passive, rebellious, stubborn, cooperative, or as some combination of these and other attributes, and his decisions about how to lead will reflect these assumptions. Whether he is a teacher trying to weigh the advantages of various teaching styles or a head of state trying to create his own brand of utopia, the accuracy of the assumptions made will greatly affect his success as a leader. In these and parallel cases it is important to inquire into the nature of man as a follower, pupil, or employee.

The seminar will examine two closely related aspects of an individual's experience in small groups: 1) his feelings about and ways of behaving toward the leader of the group, and 2) the development of trusting and friendly relations with the other group members. Particular attention will be paid to groups in which the leader is imposed upon rather than elected or chosen by the group. Studies of classroom groups, the military, and the family will be examined in this connection.

Some of the issues to be treated in the discussions and reading are: 1) What are the important differences between individuals in the way they react to authority; 2) How can these different reactions be related, on the one hand, to the style of leadership employed by the leader and, on the other hand, to the different personalities and backgrounds of the group members; 3) How does the way an individual reacts to authority relate to his way of reacting to the other group members; and 4) Under what kind of leadership do group members find it most possible to develop trusting and collaborative relations with each other? The reading for the term will include selections from Freud, Fromm, and recent studies of small groups. In the last half of the term the seminar will carry out a research project, designed to clarify and extend some of the notions developed during the term.

fall term
half-course credit

DR. MURRAY MELBIN will offer a seminar on the adaptation of individuals to large organizations in modern society.

We spend much time in such organizations—as students in school, as workers in professions or in industry, as patients in hospitals, as vacationers at resorts. Because such organizations are growing larger and touching more of our lives, it is timely to investigate how a person chooses an organizational role, what influences his behavior in that role, and what effect the experience has on his personality.

The seminar will begin by comparing two outstanding theories of adaptation: evolution as portrayed by Charles Darwin, and psychoanalytic theory as developed by Sigmund Freud. Members will then conduct projects in which one of the two theories is applied to cases of their own choosing. No special preparation is needed for this seminar.

throughout the year
full-course credit

PROFESSOR EVERETT MENDELSOHN will conduct a seminar on modern science and its social context. Using the approach of the historian the group will examine such problems as:

Social Responsibilities of the Scientist
(Should the scientist concern himself with the "uses" to which his work may be put?)

Science and Government Policy
(What factors govern the advice given by the scientist to government? Is "big government" harmful to scientific independence?)

Science and War
(Has the scientist a more than technical responsibility for the direction and shape of war?)

"Pure" Science vs. Applied Science
(What role does basic research play in scientific and technological development?)

Science and Secrecy
(Can science be kept secret?)

The Public and the Scientist
(Does science need a public?)

Science as a Profession
(Who are the scientists? Where do they work?)

Members of the seminar will meet regularly for reports and discussion and will also be expected to submit several essays during the year. Students enrolled in the seminar will be expected to participate also in the work of Social Sciences 119, offered in the fall term by Professors Cohen and Mendelsohn; they will not normally enroll separately in Social Sciences 119.

throughout the year
full-course credit

PROFESSOR DONALD MENZEL will conduct a seminar in astronomy. In weekly meetings with Professor Menzel and other members of the department, the students will investigate a wide range of topics, determined to some extent by observable astronomical events occurring during the year. (One such event will be the transit of Mercury across the sun's disc on November 7.) Research projects, assigned on both an individual and a group basis, will involve visual observation and photography with Observatory telescopes and accessory equipment. The student may participate in the planning and preparation of instrumentation designed for use in satellites and space probes. General reading will cover such topics as the philosophy of science and the scientific method in addition to more specialized subjects. The seminar will feature the writing of scientific papers and reports.

Participants will normally take Astronomy 1 concurrently, although students with extraordinary background in astronomy may, with Professor Menzel's permission, substitute a more advanced course within the department.

throughout the year
full-course credit

PROFESSOR MARTIN MEYERSON will conduct a seminar on the urban community.

Scholars from many disciplines study cities and their suburbs. Humanists study the arts and history of the metropolis. Social scientists study its economy, social organization and political structure. At the same time, policy-makers have to reach decisions on such urban problems as housing, race, transportation, education and health. Only recently have the interests of the scholars and the policy-makers begun to converge.

Using the Boston metropolitan area as an example, the seminar will explore the ways in which the present scholarly literature and research from various disciplines can help improve public policy. Enrollment will be limited to 10 students, each of whom will do some field work on a physical or social feature of the Boston region.

fall term
half-course credit

PROFESSOR DOUGLAS MILLER will conduct a seminar concerned with the development of a new method for studying elementary particle interactions. The experimental work will suggest individual problems in magnetism, kinematics, atomic physics, electronics, nuclear physics, and data analysis. Common reading and regular research reports will provide an organization for the seminar.

spring term
half-course credit

DEAN JOHN MONRO will work with a group of eight freshmen interested in an extensive extra experience in expository writing.

All members will take General Education Ahf, and also, preferably, Humanities 2. The group will meet regularly once a week for two hours, and there will be individual conferences. The program will consist mainly of the critical examination and careful rewriting of papers submitted in General Education Ahf, Humanities 2, or other courses.

In selecting members of the group, consideration will be given to students whose school experience in writing has been meager, as well as to students whose preparation has been thorough.

throughout the year
half-course credit

MR. THOMAS NAGEL will conduct a seminar dealing with certain philosophical problems about human action. The questions to be discussed will include the following: whether all actions are necessarily self-interested; whether a tenable distinction can be made between rational and emotional motivation; whether human actions require a special mentalistic kind of explanation, or can be regarded as complex physical phenomena subject to the sort of account appropriate in the physical sciences; whether human beings have free will; whether the mind or soul is distinct from the brain.

Original thinking by students on these questions will be expected, the results to be embodied in frequent short papers and in weekly discussions. There will be a strong emphasis on clarity, rigor, and development of the ability to construct good arguments and destroy bad ones A taste for analytic thought, writing, and discussion is desirable.

I: throughout the year
full-course credit
II, III: fall term; repeated spring term
half-course credit

PROFESSOR ANTHONY OETTINGER AND MR. EDWARD STORM will direct a seminar in the theory and application of automatic computing machines. The emphasis will be on the interaction of computer technology with a variety of disciplines including Linguistics. Mathematical research and Logic, Economics and the Social Sciences, Psychology, Medicine, Statistics, Engineering, and others. The extent to which computers may be applied to structural analysis will be considered both in theory and in practice.

Early in the term each student will select a specific topic and survey the literature relating to it. As a major effort in the seminar students may participate as a group in a substantial research project or may investigate individual problems of a suitable nature.

No prior familiarity with computing machines is expected, and the seminar will be open to qualified students who may wish to bring to bear interests and perspectives from the humanities and social sciences as well as from the natural sciences. The seminar will meet regularly once a week, with occasional extra sessions for guest speakers or laboratory work.

Students may not normally count for credit both this seminar and Engineering Sciences 10.

throughout the year
full-course credit

THE DEPARTMENT OF PHYSICS will make available to six or eight freshmen in the spring term an opportunity for independent research aimed at developing demonstration apparatus for instructional use.

Designing and constructing their own apparatus, members of the group will attempt to develop practicable experiments demonstrating such ideas as potential, momentum, phase, quantum, and field.

Participants will be chosen on the basis of their interest in work of this kind and need not necessarily be potential physics concentrators. They should, however, have had at least one year of the calculus.

spring term
half-course credit

PROFESSOR NORMAN RAMSEY will conduct a seminar in modern physics.

Topics discussed will probably include quantum mechanics, special relativity theory, elementary particles and their interactions, molecular beam research, high energy accelerators, and possibly other topics in which the students taking the seminar have special interest. The seminar will be conducted on a reading and informal discussion basis, with both the students and the instructor presenting reports on the topics concerned.

fall term
half-course credit

DR. ROBERT RICHARDSON will conduct a seminar on forms of the epic in American literature.

The seminar will trace some of the variations and mutations of the epic in American literature. Starting with a consideration of the decline of epic as a strict genre, the group will proceed to examine certain American works which make use of epic ideas and techniques. Authors to be considered include Barlow, Thoreau, Melville, Whitman, Norris, Eliot, Pound, Robinson, S. V. Benet, MacLeish, Sandburg and W. C. Williams.

Some acquaintance with classical epic and English epic will be useful, but admission will not be restricted on this basis. The seminar will meet weekly; a report and a paper will be required of each student.

fall term
half-course credit

Under the direction of PROFESSOR DAVID RIESMAN and a small staff, including DR. KENNETH KENISTON, DR. DOROTHY LEE, DR. SUSANNE RUDOLPH, several freshman workshops (discussion groups of between 6 and 12) will meet at least twice each week. The purpose will be to work with students toward the integration of their several areas of study—toward the integration of these areas with each other and with the concerns of the individual student. A beginning will be made through examining some theories about the relationship of the individual to culture, and two basic concepts will be stressed: that of culture (in the anthropological sense) and that of the unconscious. (Thus readings will include works of Ruth Benedict, Sigmund Freud, and Erich Fromm, among others). Thereafter, both the student within his workshop and the various workshops within the larger program will be encouraged to develop their studies idiosyncratically according to their interests, while sharing a minimal common core of readings primarily in the social sciences.

In addition to the regular meetings of the workshops, there will be weekly dinner meetings of the entire program, with speakers drawn from many different fields, including the sciences.

In order to establish some common terms and perspectives, all members will be asked also to enroll in Humanities 6 (Introduction to Literature, Professor Reuben Brower) and in Social Sciences 136 (Character and Social Structure in America, Professor Riesman [Spring term only]). The weekly section meetings in Social Sciences 136, taught by instructors in the freshman program, will in the Spring term replace one of the weekly meetings of the workshops. Thus in both terms the student will be left with two elective courses.

The staff of the workshops wants to enlist freshmen, irrespective of academic background, who are adventurous enough to depart somewhat from the usual freshman program, and has therefore not singled out any students for special invitation, feeling that the student himself will be the best judge of whether or not he would meet this criterion. Should more freshmen than can be included in the program express interest in it, selection will be based on an attempt to create a group with varied backgrounds and interests. Both Harvard and Radcliffe freshmen will be enrolled.

throughout the year
full-course credit

PROFESSOR EUGENE ROCHOW will direct a program in general chemistry for interested students of demonstrated ability in the field.

Each member of the seminar will work closely with a member of the Department who is engaged in actual research. Laboratory work and related study will be supplemented by reading and individual reports concerned with more general topics in the field. Opportunity for independent research will be provided for students who in the course of the year develop serious interest in intelligent research projects of their own.

throughout the year
full-course credit

DR. GEORGE ROSENWALD will lead a seminar on the psychoanalytic conception of personality. In the course of the year the seminar will consider both Freud's original insight and the later revisions introduced by ego psychologists and cultural anthropologists.

During the first semester the seminar will study infantile modes of experience, motivation and cognition as these were described by Freud and his followers. Through analysis of psychological test materials, artistic productions and life histories, students may develop an appreciation of the ways in which unconscious processes continue to influence thought and behavior in adult life.

In the second semester the seminar will consider those sectors of personality which develop through exposure to a social milieu broader than the primary family unit. Attention will shift from the irrational and idiosyncratic to parameters such as 'ego ideal' and 'ego identity'—those which reflect the individual's recognition of and commitment to a social existence. The social influences in personality development will be highlighted through comparative studies of behavior in contrasting cultural settings.

Independent work and painstaking study of materials will be required: accordingly, only students with a serious interest in the social sciences should apply.

throughout the year
full-course credit

DR. RICHARD EVANS SCHULTES will offer two seminars: one in Economic Botany, the other in Tropical Botany. General reading and informal discussion in fortnightly meetings, supplemented by laboratory and/or herbarium investigation, will emphasize the principles underlying research in both fields. A short paper on a specific research problem chosen by the student will ordinarily be required. This problem, not connected with the instructor's personal research, will be designed to broaden the student's outlook and preparation.

The seminar in Economic Botany will be concerned with such topics as dependence of man upon the plant kingdom; dependence of many cultivated plants upon man; origin and evolution of some of our cultivated plants; beginnings of agriculture and their social and cultural implications; study of prehistoric plant remains and the importance of plants to life in ancient civilizations; plants as foods, medicines, narcotics, poisons, etc. While basically biological in orientation, this seminar will be interdisciplinary, drawing upon anthropology, archaeology, geography, history and plant chemistry.

The seminar in Tropical Botany will consider such topics as tropical vegetation zones of the world and their influence upon human living conditions; kinds of forest in the wet tropics and their structure; ecology of a typical Amazonian rain forest; outstanding economic plant-products of the tropics, especially of the forested areas.

Both seminars will be designed primarily for the student who may have an interest in continuing in some phase of economic or tropical botany, especially for those hoping to engage in field work or exploration; but qualified freshmen not having such plans will not be excluded. The only prerequisites are interest and a good biology course (which included botany) in secondary school.

Academic credit for this work may be granted, where appropriate, by approval of the seminar leader.

throughout the year

DR. MARTIN SHAPIRO will conduct a seminar in government, focusing upon current civil rights problems and what the Supreme Court can, does, and should do about them. Students will be expected to prepare and argue certain key civil rights cases which have been decided by, or are pending before, the Supreme Court. Some students will be asked to write seminar papers, others to prepare judicial opinions. A certain amount of team or group preparation will be encouraged if the members of the seminar find this approach congenial.

The specific problems to be dealt with will be determined by the interests of the students. Voting rights, testimony before Congressional committees, obscene publications, secret membership organizations, search and seizure, double jeopardy, Sunday closing laws, state aid to religion, and Communist Party membership are some of the areas which might be examined. If several students have a particular interest in the institutional bases of American national government, they might prepare one or more meetings of the seminar dealing with the general problem of judicial review and the role of the Supreme Court as an agency of the central government.

The seminar does not require any special background or advance preparation. It does, however, require an ability to both construct and follow a logical argument. Those students whose tastes run to emotional rhetoric or anecdotal ramblings are likely to find better use for their talents elsewhere.

throughout the year
full-course credit

DR. MAURICE SHRODER, with the assistance of the staff of French 20, will offer for ten or twelve freshmen a seminar on genre, in theory and practice, in connection with French 20, "Main Currents in French Literature."

The seminar will read, in French, works from the body of French literature since the Renaissance, complemented by the study of various essays in genre. The aim of the program will be to introduce the students to the concept of genre as exemplified in a single literary tradition; the seminar will thus complement the historical approach to French literature used in French 20.

Informal weekly meetings will provide opportunity for students to discuss the material of the seminar; short essays on the works read and the concepts studied will be required.

Members of the group will be drawn from French 20; students who are interested should apply during the fall to Dr. Shroder. There is no need to apply in advance.

spring term
half-course credit

PROFESSOR KRISTER STENDAHL will conduct a seminar concerned with the nature of biblical thought in its original settings.

The group will meet biweekly for discussion of texts and studies which are especially suited for recapturing the original strata of meaning and the frames of reference for the biblical understanding of God, man, and the world —in conscious contrast to later Jewish and Christian interpretations.

During the fall term the participants are expected to limit themselves to strictly descriptive work. In the spring term some attention will be given to the relation between the biblical "original" and contemporary philosophical and theological understanding of religion.

Applicants for this seminar are asked to submit a one-page paper explaining their reasons for seeking enrollment and indicating their background in languages and in the general area of the humanities.

throughout the year
full-course credit

PROFESSOR ZEPH STEWART will conduct for not more than eight students a seminar in problems of interpretation and translation of Latin (and perhaps Greek) literature. The seminar will meet for a two- to three-hour session every other week throughout the year. Short passages, both poetry and prose, will be carefully analyzed with two related purposes in mind: first, to see what distinguishes good from bad writing—to determine what effect the author intended to produce and how he went about it; second, and in more detail, to examine ways of translating the selections effectively into English. A little time will have to be spent, for background, on the problems of the transmission of texts from antiquity. Analysis at each meeting of particular aspects of a selected passage and comparison of different translations of it will lead eventually to individual studies on a larger scale.

The work will be intensive rather than extensive; there will be no attempt to deal with a whole author or a whole period. The object will be merely to illustrate, by using Latin texts and translations of them, some critical problems of literary language. If by chance all members of the seminar know Greek, selections from Greek literature will be used as well. This seminar is not, however, limited to prospective concentrators in Latin or Greek, but is meant rather for anyone who is interested in using his knowledge of Latin to approach some general problems of literary criticism.

Members of this seminar will be exempted from the General Education A requirement.

throughout the year
half-course credit

MISS SUSAN TAX will conduct a seminar on the relationship between the individual and his culture and society. Materials will be drawn from the humanities and the social sciences, from non-Western sources as well as from the Western tradition.

The seminar will inquire into what appear to be universal elements of the human condition: the biological bases of man's behaviour, the concept of the supernatural in its various formulations, aggression, ambivalence, love, and the fear of death. These universal characteristics will then be examined in different cultural contexts: how do different cultures deal with aggression, with the fact of death; how do they define love and work; and what is their view of the good life? Do different cultures, in dealing with these problems, emphasize some aspects of human nature more than others; and if so, will not these different emphases produce in different cultures different types of personality? The seminar will inquire into the implications of cultural differences and into the possibilities for communication between cultures.

There will be weekly discussions of common reading in addition to independent work, written reports, and conferences with the seminar leader.

throughout the year
full-course credit

PROFESSOR JACQUELINE TYRWHITT will direct a group of 6-8 freshmen in a visual evaluation of the urban environment, using metropolitan Boston as the field of study. The project will concern itself with those aspects of the urban scene which now inspire pride, or which once did so. These may sometimes be major buildings or open spaces, sometimes visually insignificant places of historic or emotional importance. In what terms are these now visually evaluated? Has this changed over a period of time? If so, what has caused the change?

Each student will be asked to look with fresh eyes at some selected aspect of the metropolitan environment, and to examine works of literature, art and science which may illuminate present (or former) attitudes toward it. It is hoped that the resulting comparative studies may suggest methods for a more significant structuring of the urban scene.

spring term
half-course credit

PROFESSOR EVON VOGT will conduct a study of the ancient and modern Maya Indians.

One of the major concerns of anthropology is to understand (and eventually explain) what determines and changes the patterns of human culture. By making intensive comparative studies of cultures that were derived from a parent stock, anthropologists are able to examine the uniformities and variations in patterns and to advance our knowledge of the factors that determine cultural behavior. An interesting set of cases for comparative analysis is provided by the two million Maya Indians of Mexico and Guatemala who are all descended from a parent stock living in Middle America some 3500 years ago.

The purpose of this seminar will be to train a small group of interested freshmen in the concepts, methods and techniques that anthropologists are now utilizing to study comparatively the cultures of the prehistoric and contemporary Maya Indians. The students will then be set to work on a series of selected problems involving the analysis of the Peabody Museum's field data from Maya prehistoric sites and from the seminar leader's field data from contemporary Maya communities in the Highlands of Chiapas, Mexico. The following problems are offered as suggestions for special projects by members of the seminar:

1) A critical review and comparison of the theories of Thompson and Knorozov on the problem of deciphering ancient Maya glyphs.

2) A critical review of the various theories for the collapse and abandonment of the centers of Maya civilization in the Peten (Lowland Guatemala).

3) An analysis of the geographical, historical, and cultural determinants of the dispersed settlement pattern of the ancient and contemporary Maya.

4) A comparative study of the names and attributes of aboriginal Maya gods.

5) A comparison between the "name-groups" (probably representing the vestiges of patrilineages) in the modern Maya communities of Chiapas

and the "name-groups" reported by the early Spanish chroniclers in Yucatan.

6) An analysis of the cultural synthesis between ancient Maya and Spanish Catholic found in the contemporary Maya regions in Chiapas.

7) A study of the techniques used by Maya curanderos to divine the cause of illness and the ritual techniques used in their ceremonies.

8) A comparative analysis of contemporary Maya kinship systems with a view to reconstructing the proto-Maya kinship system and charting the changes that have occurred in various parts of the Maya region.

9) An analysis of the meaning and function of the thousands of small pottery figurines (fashioned in the form of animals and humans) found in prehistoric Maya sites.

throughout the year
full-course credit

PROFESSOR JOHN WELSH will provide opportunity for one or two qualified freshmen to do collaborative research in the field of comparative neurophysiology. Problems under investigation include the distribution, metabolism, and physiological roles of neurohormones Preference will be given to students who have had some experience beyond the usual high school biology course.

Academic credit for this work may be granted, where appropriate, by approval of Professor Welsh.

throughout the year

PROFESSOR MORTON WHITE will conduct a seminar for five or six students on some philosophical problems of theoretical and practical importance. The main concern of the seminar will be to deal philosophically with selected topics that arise in the fields of history, law, politics and religion. Brief papers will be required, and active participation in discussion will be expected of those who enroll.

fall term
half-course credit

DR. WALTER MUIR WHITEHILL will conduct a seminar on the history of Boston.

The aim of the seminar will be to use Boston as an example of how and why cities develop; to introduce students to historical sources and attempt to show how the historian uses them; to give the students some experience with the methods of research and the literate presentation of their findings; to try to lead them to see how the past of Boston is related to the city as they know it, and to provide, as by-product, a useful familiarity with the city.

Following a topographical and historical orientation, each student will be expected to pursue an independent inquiry into some aspect of Boston's history. Both in those investigations and in the group's discussions the seminar will emphasize the importance of non-written as well as written resources, the European origins of what is encountered, and the relevance of developments in the history of Boston to the history of the students' own regions.

The seminar will meet at the Boston Athenaeum (10½ Beacon Street, Boston), readily accessible from Harvard by subway. Applicants should read in advance Whitehill, Walter Muir, Boston, A Topographical History, Cambridge, 1959.

throughout the year
full-course credit

DR. DEAN WHITLA will conduct an investigation of quantitative methods useful in the analysis of personal and institutional behavior and interaction. The investigation will be concerned mainly with determining whether thoughtful and skilled research can yield valid and intelligible generalizations about the ways in which society behaves.

Students in the seminar will follow the evolution of voter opinion during an election campaign. Through a series of interviews with constituents, an examination will be made of the effectiveness of campaign strategy in influencing voters. Information gathered by polling will also be used to predict election results. The investigation will center on candidates for public office in Massachusetts.

While the work of the seminar will focus primarily on the research problem, the aim will be to enable the students to understand and use with some sophistication techniques that are widely applicable to research in the behavioral sciences.

fall term
half-course credit

DR. WILLIAM WIEGAND will conduct a seminar in writing for eight to ten freshmen.

Though some expository writing will be required, the seminar will be directed mainly toward training those literary skills which would be of particular value in the writing of fiction. In the early meetings specific examples of professional fiction will be considered in order to study individual aspects of the art. Weekly written exercises will be required and discussed in the seminar. Later the student may write more freely, perhaps a short story or two in the course of the year; these efforts will be discussed critically in the seminar in order to help him revise his work.

Applicants may be asked in September to submit a sample of their writing before admission to the seminar.

Members of this seminar will be exempted from General Education A.
throughout the year
full-course credit

PROFESSOR G. WALLACE WOODWORTH will conduct a seminar on readings and music supplementary to the regular assignments in Music 1.

The seminar will offer opportunities for study and discussion in some depth of music, selected readings, and historical concepts not examined in detail in the regular work of the course.

Membership in the seminar will be limited to ten to fifteen freshmen selected for their interest and intelligence as demonstrated in the early section meetings of Music 1.

throughout the year
no credit